Military Intelligence

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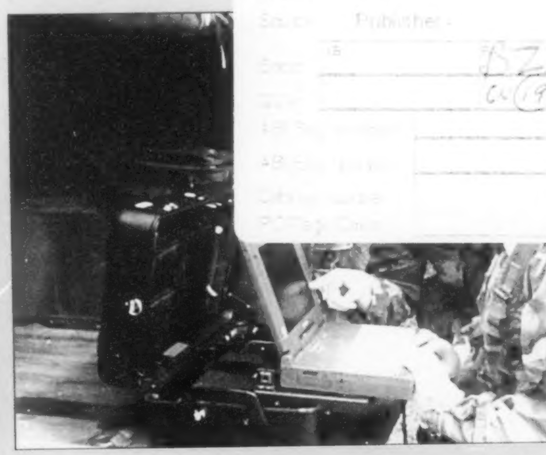

MI Modernization

FROM THE EDITOR

In the last decade, the U.S. Army has made great progress moving from a Cold War-oriented force to a more versatile, adaptable Army capable of meeting the challenges of the complex, asymmetrical, and nonlinear modern battlespace. Our military intelligence (MI) Corps has been a leader of that change. We have begun to implement our Intel XXI vision using new intelligence systems and modular deployable organizations that facilitate Force XXI operations. Under the aegis of the Army Deputy Chief of Staff for Intelligence, the Intel XXI Study Task Force, led by Brigadier General Wayne M. Hall, has thoroughly reviewed Army intelligence operations and will release a report to further define and refine what MI must be by 2010. The study will recommend changes and focus our efforts in achieving the goal of ensuring that our commanders receive relevant and accurate intelligence.

The Army has completed three years of Advanced Warfighting Experiments and other exercises to test some of these organizations, systems, and architectures. The data from the AWEs and additional exercises will help to perfect these new ideas and methods and lead toward our prototypical structures, the First Digital Division and First Digital Corps, which will undergo formal testing beginning about 2001.

The focus of the ***Military Intelligence Professional Bulletin*** this quarter is on MI modernization. In this issue, we present a number of articles discussing aspects of MI modernization covering both force modernization and the major systems in use and development. In his introductory article, Colonel Al Elliott discusses the "whys" and "hows" of MI modernization. He explains how the Army's intelligence and electronic warfare (IEW) modernization efforts will continue to guide the transformation of new concepts and technologies into warfighting capabilities and allow Army commanders to achieve dominant battlefield awareness. As he says, *"By 2010, Army intelligence will achieve an order of magnitude increase in overall capability as it fields objective collection, processing, exploitation, and dissemination systems. In the long term, we will provide the IEW force for the Army After Next."*

Thanks to the Army Deputy Chief of Staff for Operations and Plans Intelligence Electronic Warfare/Command and Control Countermeasures Division for helping write and orchestrate this issue of ***MIPB***. We thank the many Program and Project Managers and the TRADOC Systems Manager Offices for their writing, review, and other support for the articles herein.

Due to size constraints, we were unable to include two articles on the Tactical Exploitation of National Capabilities (TENCAP) Program. The first, by Captain Keith Filer and Chief Warrant Officer Two Edward Moore, presents an overview of the current and emerging TENCAP systems and capabilities. Lieutenant Colonel Randy Spilde and Ms. Sharon Carvalho of the Army Space Program Office focus their article on the Tactical Exploitation System (TES), which will merge three older systems into a corps and echelons above corps (EAC) asset, as well as a future divisional asset. These articles will be in our April-June 1999 issue.

Elizabeth A. McGovern

Writer of the Quarter

MIPB is pleased to announce that Colonel William M. Knarr, Jr., is our October-December 1998 Writer of the Quarter for his article, "A Family of UAVs—Providing Integrated, Responsive Support to the Commander at Every Echelon." Congratulations to Colonel Knarr and many thanks to all our authors for their great articles. Contributions like yours make ***MIPB*** the forum for MI professionals.

How to Submit an Article

MIPB is always seeking good articles on a variety of topics as well as action photographs of MI soldiers. Please see page 41 for some suggested topics and instructions on how to submit your article or pictures.

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Purpose: The U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH) publishes the ***Military Intelligence Professional Bulletin*** quarterly under provisions of **AR 25-30**. ***MIPB*** disseminates material designed to enhance individuals' knowledge of past, current, and emerging concepts, doctrine, material, training, and professional developments in the MI Corps.

Submissions: Please send your manuscripts, letters to the editor, photographs, and any inquiries to: Commander, USAIC&FH, ATTN: ATZS-CLM, Fort Huachuca, AZ 85613-6000; send via E-mail to mipb@huachuca-emh1.army.mil and an information copy to mcgoverne@ huachuca-emh1.army.mil; or telephone (520) 538-1006/5 or DSN 879-1006/5.

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FEATURES

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VANTAGE POINT

by Brigadier General Wayne M. Hall

For the past six months, I have had the honor of leading the Deputy Chief of Staff for Intelligence's (DCSINT) effort to redefine Army intelligence for the 21st century. The **Intel XXI Study** is nearing the end, and we expect completion of the formal part of the study by the end of March. I want to share some of my thoughts and reflections on what we have done with the study.

Our first undertaking was to determine our future environment, one that is changing rapidly and, with the continuing information revolution, an environment that will continue to change at a more rapid pace. This future environment will bring—with a variety of traditional, conventional, and industrial age threats—a variety of new threats; our soldiers will face asymmetrical and asynchronous threats. In its simplest state, asymmetrical warfare is a weak opponent seeking offsets against a stronger foe. Such activity is nothing new—weaker competitors always have sought an advantage against a bigger, stronger foe. What is new, however, involves our dependency on technology (our new strengths bring new vulnerabilities). Asymmetrical threats will often exhibit a flagrant disregard for fighting in ways we consider either "traditional" or "fair" (everyone and everything is a target, no sanctuaries). Finally, the proliferation of weapons of mass destruction will continue. Asynchronous warfare, in a broad context, seeks to attain advantage through timing and synchronization. Those who pursue inroads to power by leveraging asynchronous operations work to deny a similar advantage to opponents.

As another major influence on the environments in which we will operate, the advent of Iridium and Teledesic (high-speed global information access systems) will enable people of all walks of life to access information through the Internet regardless of either time or location constraints. Through this access, our opponents will be able to coordinate activities across time and space. Moreover, they will be able to learn and adapt very quickly. Information access will indeed remove barriers for our opponents to become learning and adapting organisms.

Inherent in this changing environment, we will experience a change in how we perform our jobs and will experience a change in the products we need to support our customers (combat commanders and decision-makers). Intelligence support will not rely on commanders' organic assets. Quite simply, the world is too complex and environments shift too quickly and dramatically to allow inflexible organizations, equipment, or minds. The threats we face in the future will be too smart and adaptive for any commander to gain the necessary information on their own. With that said, commanders will receive their information and intelligence support from a re-looked, redesigned, and retooled "system of systems" whereby we will satisfy commander's information needs with an integrated system of people, collectors, automation, and communications reaching to the national level. Lines differentiating levels of war, and echelons above corps (EAC) from echelons corps and below (ECB), will blur and become less easily defined.

I have traveled throughout the country talking with senior leaders about current perceptions of the military intelligence force, and the products and support we provide. Without equivocation, those senior commanders have praised and applauded the performance of the MI personnel who support them. I have concluded that we have terrific soldiers and that all we need is to posture ourselves for the 21st century by tweaking our doctrine, training and education, leadership, organizations, materiel, and soldier systems. We must change these areas to have the potential to provide the best intelligence support to the combat forces regardless of environmental fluctuation.

Our vector for the future revolves around six things. **First**, we have must rework our doctrine to capture the environmental impacts on our future missions. We must start with doctrine, as it drives training and education, materiel development, and so forth. **Second**, we have to develop intellects sufficient to synthesize vast amounts of information so we can know what the information means and perform complex mental tasks inherent to operations such as information operations (IO). In line with training and education, we have to enable people to state their information requirements adequately (specificity, timeliness, accuracy, relevancy) and discipline our thinking so we can answer questions our leaders ask. **Third**, we have to "tweak" our leadership to prepare it for operating more effectively in the next century. As such, our leaders will develop and impart vision, mentor their subordinates, and develop organizational environments conducive to discovery learning. **Fourth**, we have to create organizations flexible enough to endure rapid change from dramatic alterations in mission environments. These organizations will consist of teams of experts who will gather to solve issues and problems and disband

upon completion. **Fifth**, we must develop materiel flexible and adaptable to new environments. This materiel will have to contribute to IO, visualization, processing, thinking, and collection—or it will quickly become extinct. **Sixth**, we have to attract, retain, and develop people for accomplishing the increasingly complex tasks the MI Corps faces in the 21st century.

To accomplish these tasks, our most important challenge is to lead more effectively. For the most part, our leadership in the past has been up to the challenges of the times. Our leadership must undergo a few changes to prepare for the new century. How do we do this?

First, our senior leadership needs to help our people move into the future by developing a clear vision, focusing on a changing vector, and identifying steps to take along the paths leading into the future, while encouraging their subordinates to shape the future. Next, it is abundantly clear that our people want to stay abreast of the future and to participate in shaping it. Leaders need to enable this desire. As senior leaders, we need to do more to keep those who comprise the MI Corps (military and civilian) informed and involved in the process. As an example, officer professional development (OPD) classes and noncommissioned officers professional development (NCOPD) sessions provide useful mechanisms for senior leaders to remain cognizant of what their subordinates are experiencing and thinking and to help these subordinates learn. Additionally, we need to create methods to keep those in the field and other intelligence organizations apprised of developments in the evolution of Intelligence XXI and other futuristic endeavors affecting them. We need to seek out and use everyone's ideas more aggressively than before. One method we have developed during the Task Force is the Creative Idea Net (www.dami.army.pentagon.mil/creative_ideas/main.html) under the DCSINT home page. This is a forum where we can post ideas and think-pieces, debate their worth, and improve our knowledge and understanding, thus improving our contributions to the Army. This web page is working now; we want your thoughts regardless of your rank.

The challenges ahead of us are tremendous, but they will be fun. You are in the Army at the right time, you are in the right branch, and you have a great future unfolding before your eyes. The swirling change of the information revolution is causing what you do every day to be more important and more recognizable by your senior leaders. With good vision, creative thinking, mastery of fundamentals, improved leadership, and continued dedication to excellence, our branch can make the changes it needs to make, and meet any challenges that come our way. I am exceptionally proud of all of you, and proud to be able to serve our great Army and our country as an MI professional.

ALWAYS OUT FRONT!

CSM FORUM

by Command Sergeant Major Scott C. Chunn

I hope everyone had a happy holiday season and is gearing up for the tremendous year ahead of us. We face many challenges in 1999.

I was fortunate to visit a number of units in the last couple of months. In November, the 224th MI Battalion at Hunter Army Airfield put on a dining-in where the camaraderie was great. Thanks for a memorable evening and visit.

In December I visited Fort Bragg, North Carolina, and spent a few days with the great soldiers of the XVIII Airborne Corps' 525th MI Brigade (the only Airborne MI brigade in the Army as CSM Campbell fondly refers to them), the 82d Airborne Division 313th MI Battalion, and units of the Special Forces Command (5th and 7th Special Forces Groups), and U.S. Army Special Operations Command. I am amazed at the quality of our soldiers every time I visit a unit. We truly have the best! I would like to thank all the units that took the time to host my visit and to make it memorable. You are all doing important work – thanks.

In February I will be visiting our MI students and the U.S. Army Sergeants Major Academy. They are hoping to upgrade the "MI Room" at the academy. I have not seen the MI Room in years and I understand it is rather austere. If any of you have memorabilia your units would be willing to donate toward this cause, it would be greatly appreciated. Point of contact for this action is Sergeant Major Ronnie Chaney at the Academy, Command Sergeant Major Wright at the Intelligence and Security Command (INSCOM), or myself.

By now all of you should have received the message or information concerning the CSM/SGM Worldwide Conference. This will be a full conference this year in-

stead of the mini-conference. There have been so many changes in MI Sergeants Major positions and in MI itself that we felt this was necessary and beneficial for all. The conference will be 1 to 5 March 1999 and if you have any questions please feel free to contact SGM "Bo" Long at DSN 821-5774 (E-mail longo@huachuca-emh1.army.mil), MSG Paul Moore at DSN 821-1174 (E-mail moorep@huachuca-emh1.army.mil), or my office at DSN 821-1145/1146 (E-mail chunns@huahuca-emh1.army.mil). I hope to see all the Sergeants Major at the conference this year and look forward to your input in resolving MI Issues.

As always, train hard, take care of soldiers and their families, and have fun. Thanks!

ALWAYS OUT FRONT!

ASAS Master Analyst Program
Sly Fox Den ASI 1F Notes

The U.S. Army Military Intelligence Corps is offering a unique program to provide commanders with specially trained intelligence analysts. We designed this program, the All-Source Analyst System (ASAS) Master Analyst Program (AMAP), to meet the challenges of advanced automation, and the demands of MI senior noncommissioned officers. A special branch at Fort Huachuca, Arizona, leads and coordinates all aspects of the program.

Several events over the last year have highlighted the force modernization initiatives in the Military Intelligence Corps. The major events were the Analyst of the Future Conference, the Force XXI Advanced Warfighting Experiments, and the Intel XXI Study. The focus has been on developing a balanced approach to force modernization as the corps moves towards the future. All have had impacts on the "Sly Fox" additional skill identifier (ASI) 1F program.

The Analyst of the Future Conference provided an in-depth look at what the analyst needs in terms of skill, experience, and education. For the 1F soldier, the bottom line was an increased emphasis on the requirement to perceive information in an appropriate context in terms of terrain and threat models. Additionally, the conference attendees identified new skills associated with leveraging technology to improve the dimensions of the product. We strengthened these themes in the ASAS Master Analyst Course (AMAC).

The Division XXI Advanced Warfighting Experiment (DAWE) provided an intensive look at what the intelligence battlefield operating system needs in terms of doctrine, organization, training, materiel, leadership, and soldiers in a tactical environment. For the 1F soldier, the bottom line was an increased use of technology to reshape the methods of generating intelligence. Critical to this was the extensive focus on formulating a balanced organization to leverage the technology. This effort was very successful and yielded many lessons learned. We incorporated the crucial lessons into the AMAC.

The **Intel XXI Study**, led by Brigadier General W. Michael Hall, provided a look at the future roles, missions, organizations, and capabilities of Army Intelligence. For the 1F soldier, the essential point was the increased importance of coherence, combination, and continuity, as well as thinking through synthesis and holistic planning. Vital to this was critical and creative thinking techniques. This effort yielded a vision to guide the force modernization efforts. Therefore, we expanded some of these concepts in the AMAC.

These events during 1998 have combined to affect the environment of the 1F soldier. This means that both the ASAS and the Master Analyst will endure significant change and challenges as we move toward implementing the new vision. The program is adapting to the developments as the future and the many associated challenges emerge.

Master Sergeant Michael Fallon is the Chief of the AMAP. For more information, readers can contact him or Sergeant First Class Kristine Sleighter via E-mail at amap@huachuca-emh1.army.mil, telephonically at (520) 533-4652 or DSN 821-4562, and through the Internet web page at http://138.27.202.66.

Modernization: The Path to Intel XXI and Beyond
The IEW Battlefield Operating System

by Colonel Alfred H. Elliott, III

The intelligence and electronic warfare (IEW) organizations that contributed to the overwhelming victory in Operation DESERT STORM were envisioned and built during the 1980s. Through enlightened efforts like the Army Intelligence Master Plan, the Army designed, developed, integrated, tested, and fielded these MI organizations and systems. After the war, the Military Intelligence Relook (MI Relook)—a comprehensive assessment of the lessons learned from DESERT STORM—validated the majority of our planned and programmed materiel solutions, but made significant changes to our organizational structure. Additionally, the MI Relook cast our doctrine for the end of the 20th century and laid the doctrinal foundation for our entry into the 21st century.

Although it is conceivable that some of these same systems and organizations may take us into the next century, we clearly understand that many of the systems are materially and technically reaching their retirement points and will require either replacement or major overhaul. Likewise, planned and implemented reductions in the MI force over the intervening years are causing us to relook our organizational structures. The Intel XXI Study is accomplishing this look forward. It is a Department of the Army Deputy Chief of Staff for Intelligence-sponsored and Chief of Staff, Army-approved study. The Intel XXI Task Force, under the leadership of Brigadier General Mike Hall, is chartered to take a stem-to-stern look at Army intelligence and recommend changes to ensure that Army XXI commanders receive force protection and timely, accurate intelligence. The objective of Intel XXI is not to work in the margins, but to recommend radical change where required.

FM 100-11, Force Integration, defines force modernization as the "process of improving the Army's force effectiveness and operational capabilities through force development and integration." It encompasses all of the aspects of doctrine, training, leader development, organizations, materiel, and soldiers (DTLOMS). Unfortunately, hearing the term "force modernization" often conjures up a vision of systems or a materiel solution. However, we cannot stress enough that materiel solutions are only a small part of the force modernization process. Doctrinal solutions or changes in leader development or training are the answer more often than are organizational change or materiel acquisition. Revisions in training, leader development, and doctrine can take effect much faster than major organizational restructure or materiel acquisition, and these changes are frequently much less costly. **Organizational changes and materiel solutions are usually the last choice due to the time required to implement them and the significant cost involved**.

Having said all that, the articles assembled for this edition of the ***Military Intelligence Professional Bulletin*** by design focus primarily on materiel solutions. This is because—within the Intelligence and Electronic Warfare/Command and Control Countermeasures Division of the Department of the Army (DA) Deputy Chief of Staff for Operations and Planning (DCSOPS)—our expertise and mission are centered on materiel and organizational solutions. For an organizational perspective, I refer you to the article by Lieutenant Colonel Bob Gutjahr in this issue of the ***MIPB***.

Why Do We Modernize?

The Army Modernization Plan states, "*The overarching reason to modernize is to maintain greater combat capability than a potential enemy's.*"[1] While it is inconceivable that any army can or would challenge the U.S. Army directly, the availability of modern technology on the open market, the continued existence of rogue states who will sell the means of war to any buyer, and the existence of asymmetrical threats are among the many reasons we must continuously modernize. For the intelligence discipline and others, we can expand this reasoning to include the impact of the information technology explosion. On the positive side, this explosion provides exponential improvements in our capability to gather, store, and manipulate data and

information. On the negative side, the pervasiveness of information technology introduces new operational challenges and new vulnerabilities. Technology-related problems, like information assurance and the year 2000 (Y2K) problem, will consume much of the time and effort of our greatest minds. If we are not able to solve them, our ability to achieve information dominance is in serious jeopardy. In this respect, Army modernization, in particular intelligence modernization, is a captive of future capabilities against future threats.

Equally important as the technological challenges of the "information generation" are the evolving geopolitical realignment brought on by the technology-information growth dynamic. The ability to share information in near-real time has highlighted the differences between "have" and "have-not" nations. For many have-not nations, this heightened awareness has identified areas of shared natural interest and, consequently, forged new alliances, some of which potentially may not be in our best interest. It is essential that we better understand this dynamic and act to shape it in our national interest.

What Guides Our Modernization Efforts?

The framework for identifying modernization goals and objectives comprises Joint Vision 2010, Army Vision 2010, and Intel XXI. Together they define the multidimensional, decisive nature of full dimensional operations.

Joint Vision 2010 and Army Vision 2010 set the operational context for full-spectrum dominance. We will achieve full-spectrum dominance through six patterns of operation (project the force, protect the force, shape the battlespace, conduct decisive operations, sustain the force, and gain information dominance).[2] These patterns describe the missions our combat forces must accomplish to gain battlespace dominance. While there is not space to describe each pattern of operation fully, a brief look at each one and its intelligence implications is important.

First, the Army can no longer afford to keep large numbers of forces outside the Continental United States and, therefore, must be able to **project the force** anywhere in the world. Intelligence will play an important part in the preparatory stages by providing decision-makers the information required to determine if, and when, U.S. forces should be committed. In addition, while they are enroute, the deploying units will require intelligence support for force protection and to help them better understand the operational environment upon arrival in the crisis area. Additionally, intelligence must provide a tailored organization to accompany the projecting or deploying force and a collection and analysis capability that supports it from sanctuary.

Protecting the force is always a priority and occurs throughout the operation, from predeployment to redeployment. It involves information security (INFOSEC), information assurance (IA), operational security (OPSEC), and physical and electronic protection. Intelligence is not primarily responsible for all of these mission categories; timely, accurate intelligence is crucial to the success of each. MI must assess the collection capabilities of the adversary and understand how the adversary sees us. MI must also assist in assessing the vulnerabilities of our command and control (C^2) structure and recommending appropriate courses of action to correct them. Most importantly, intelligence analysts need the tools to portray the situation clearly and concisely to the commanders, so they can make informed and intelligent decisions on how to protect their forces.

Shaping the battlespace is the process whereby the commander sets the conditions for friendly success in decisive operations. To assist the commander in shaping the battlespace, the intelligence architecture must support deep operations and targeting with dynamic, continuous, and precise collection and battle damage assessment (BDA). This includes the capability to see deep using organic collection assets, as well as the ability to leverage the capabilities of theater and national assets.

During **decisive operations**, the intelligence system must provide the same kind of support it provides for shaping the battlespace but in a potentially more dynamic and fluid operational environment. Due to the dispersed nature of decisive operations, friendly and adversary target tracking and situational awareness become more important. While timeliness is always a major consideration, in decisive operations timeliness becomes much more critical. Success is dependent upon the ability to get the right information to the right commander at the right time. Assured communications are critical.

Intel XXI is the...stepping stone to intelligence support for the Army After Next

All the patterns of operation include **sustainment operations** designed to help commanders maintain their operational tempo (OPTEMPO) while transitioning from one operation to another. During these transitions, one of the principle focuses of intelligence is force protection. Design of intelligence activities supporting

sustainment operations must avoid surprise and protect forces as they conduct these actions. Intelligence forces must also employ systems they can maintain, resupply, and redeploy with the same speed and agility as their supported forces.

Information dominance is the difference between friendly and adversary battlespace visualization and their understanding of the information environment. It is hard to achieve and is not constant. Intelligence operations must assist our commanders in creating windows of information advantage and enhance their abilities to exploit that advantage at the decisive time and place.

The final guiding document is **Intel XXI**. More specific to the subject of this article, Intel XXI is the Army's concept for Army XXI intelligence operations and the stepping stone to intelligence support for the Army After Next (AAN). We are building the Intelligence Vision for Army XXI intelligence operations on the foundation of current intelligence imperatives. Commanders will still need answers to the same basic questions. There will still be a requirement for a seamless architecture that provides a common view of the battlefield, across all echelons, from all Service sensors. Commanders will still need targetable intelligence to support simultaneous and precision attacks. There will continue to be requirements for sensor-to-shooter links so that the commander can rapidly exploit perishable information through independent decision making and accelerated OPTEMPO. Thus, the core operational principles for Intel XXI will not differ significantly from those of today. The tenets of our military and tactical intelligence doctrine embody those objectives.

These fundamental similarities, do not mean that there are not important changes. As is illustrated in Figure 1, some of the more significant differences will be—

- The systems will be on modular, more deployable platforms.
- Timeliness and accuracy requirements will be more stringent.
- Methods of delivering the critical information will change.

The design of the future intelligence system will provide an accurate and consistent picture of the battlespace at all echelons. When integrated with the overall friendly situation, this dynamically updated picture conveys an immediate understanding of the current and future situation to the commander.

The Army XXI intelligence system supports the use of lethal and non-lethal weapons to attack an adversary's decision process, as well as targeting efforts against other high-priority targets (HPTs). At the same time, intelligence must support the commanders' efforts to protect their forces. These consist of both offensive and defen-

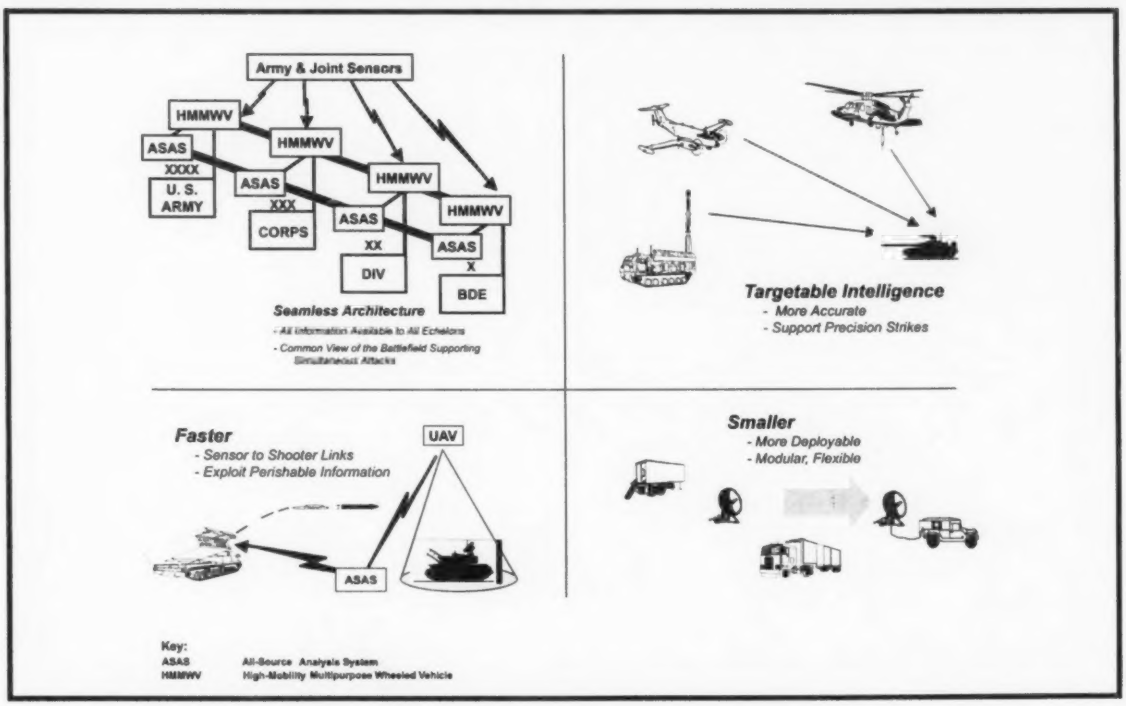


Figure 1. Intel XXI is Integral to Force XXI Operations.

sive protection activities. Offensive protection activities include those actions to reduce the adversary's ability to attack friendly C^2. Defensive protection activities focus on reducing friendly units' vulnerabilities to adversary attack by dispersing friendly forces and other physical and electronic protection techniques.

Figure 2 depicts our Intelligence Vision 2010, with the Intel XXI functions, tenets, and tasks supporting our drive toward battlespace dominance. The tasks identified in Figure 2 illustrate four of the challenges intelligence must meet to provide combat forces with dynamic and responsive intelligence support.

First, intelligence operators must be able to focus and leverage intelligence assets to include organic, joint, national, and multinational systems. Intelligence must correlate and fuse input from all battlefield sensors—whether soldiers or computers operate them—to provide a dynamic, accurate picture of the battlespace.

Intelligence XXI collection systems must enable commanders to see their extended battlespaces with greater fidelity. They must provide commanders with the intelligence needed to understand their battlespaces and to locate, identify, and track critical targets.

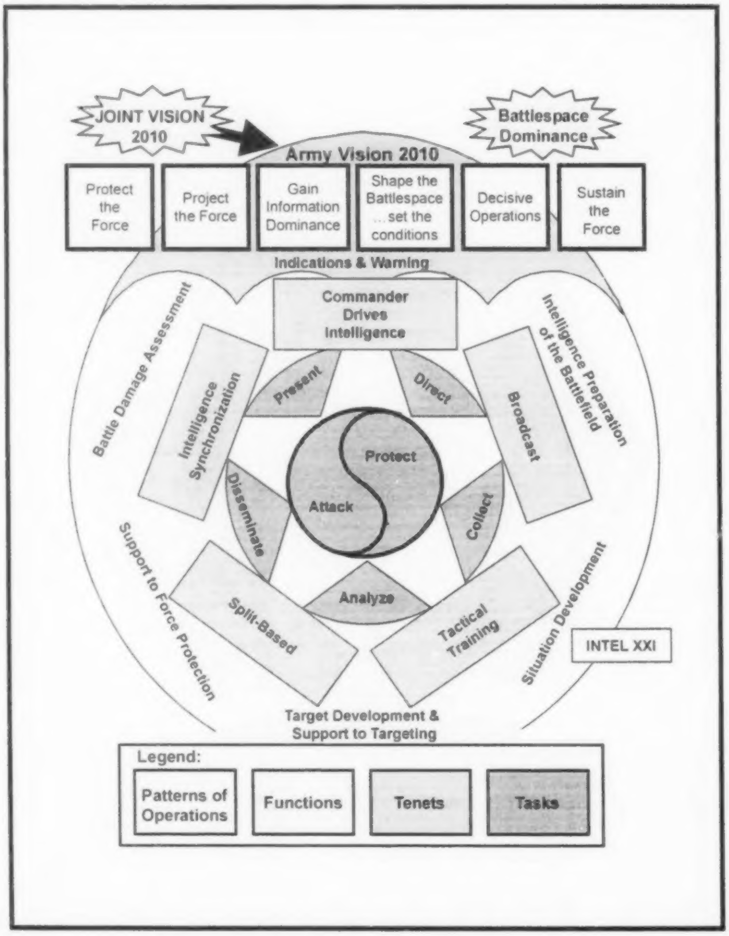


Figure 2. Intelligence Vision 2010.

Intelligence systems at all echelons must be interoperable to support rapid processing, analysis, and throughput of intelligence. This includes interoperability with systems of the other Services, theater and national intelligence organizations, and other coalition or allied intelligence organizations.

Fourth, as operational forces disperse and conduct distributed operations, a robust and flexible disemination means becomes a critical requirement. Without it, intelligence organizations will not be able to provide commanders with timely visualization of their battlespaces.

The seven tasks shown in Figure 2 (Direct, Collect, Analyze, Disseminate, Present, Protect, and Attack) are neither linear nor cyclic. In Intel XXI, they must be continuously and dynamically performed in support of the traditional doctrinal intelligence functions: indications and warning, intelligence preparation of the battlefield, situation development, target development, support to force protection, and BDA.

How Do We Modernize?

The Army Modernization Plan is one of the tools we use to manage the challenges of modernization. It provides an overarching modernization strategy that synchronizes the development and procurement of new systems while simultaneously accounting for recapitalization and the insertion of new, "leap ahead" technologies into current systems. In this manner, we are able to maintain combat overmatch while, at the same time, making the most efficient use of our research and development (R&D) and acquisition dollars. The cornerstones of this strategy are the digitization of the Army and other efforts to achieve dominant battlefield awareness. Investments in R&D are operationally evaluated in Advanced Warfighting Experiments (AWEs), Advanced Technology Demonstrations (ATDs), Advanced Concept and Technology Demonstrations (ACTDs), and the Army's

Battle Labs to minimize risk in shaping Army XXI and the AAN. We can then incrementally integrate proven technologies into the force through spiral development.[3] This orderly and disciplined approach postures Army XXI to advance to the AAN and fulfill its goal of full-spectrum dominance in the 21st century. Figure 3 shows some of the factors that are driving force modernization.

In the near term (fiscal years 1998 through 2003), modernization is driven by the requirements to equip the First Digitized Division (FDD) by FY00 and field the First Digitized Corps (FDC) by FY04. The objective is to harness the power of digital information to provide U.S. commanders with dominant battlefield awareness—a decisive operational advantage over the adversary because they know much more about the adversary than the adversary knows about them.

The challenges for the near term will include—

- Retiring obsolete systems at the division and corps level, such as the AN/TSQ-114B(V) TRAILBLAZER, AN/MLQ-34 TACJAM, etc.
- Achieving interoperability between current intelligence systems such as the family of Guardrail Common Sensor systems.
- Integration of multiple intelligence disciplines into single platforms or at single intelligence nodes, such as the capstone requirement for signals intelligence (SIGINT) and imagery intelligence (IMINT) processing.

Achieving information dominance will also require improvements in the manner in which we use and move graphical information. The objective must be achieving a more collaborative environment—a new twist to the "push-pull intelligence" philosophy enabled by the tactical internet. We often refer to this requirement as a tactical extension of the ongoing Defense Intelligence Agency (DIA) Joint Intelligence Virtual Architecture (JIVA).

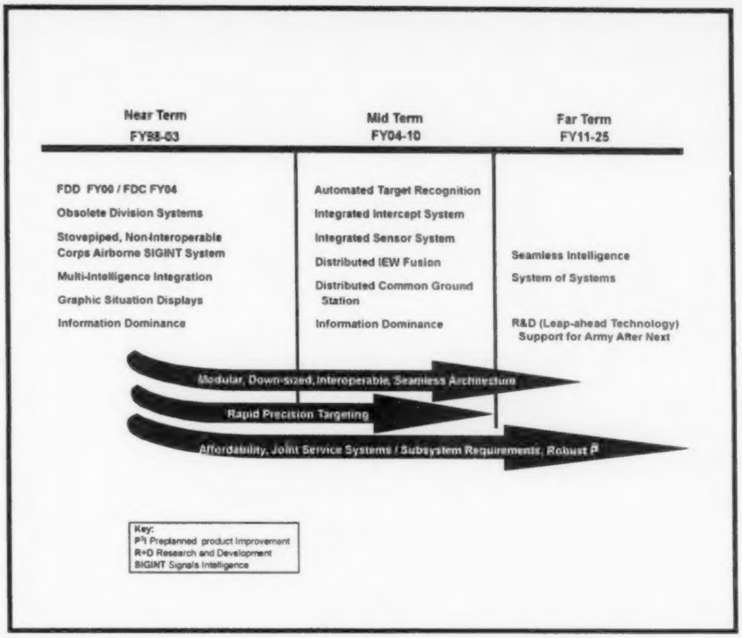


Figure 3. Factors Driving IEW Modernization.

In the mid-term (FY04 through FY10), the increased volume of data and speed of transmission will demand the use of automated target recognition (ATR) capabilities to assist in the detection, classification, recognition, and identification of HPTs. The mid-term will also see a trend to integrate IEW systems further into one integrated intercept system, one integrated sensor system, one distributed common ground station, and one distributed fusion system that together incorporate all current systems. By 2010, the Army will exploit the Force XXI effort to achieve a complete technological and cultural transformation (see Figure 4). The IEW force will have more than a decade of experience, field exercises, and experimentation validating this information. This, coupled with continuing R&D programs, will create a knowledge-based force—Army XXI—which operates with a clarity of observation, degree of decentralization, and pace of decision making unparalleled in the history of warfare. To ensure the maintenance of this mental agility for the AAN, we will evaluate all intelligence-related programs in terms of how they meet the virtual operational intelligence collaborative environment (VOICE) criteria.

VOICE is the lens through which we evaluate all initiatives considered for implementation for integration into the IEW operating system. The acronym represents the functions listed below:

- **Virtual**. Live, construct, and virtual aspects integrated into a seamless common view of the battlespace.
- **Operational**. Tactical, operational, and strategic across the entire spectrum of conflict.
- **Intelligence**. All disciplines, all tasks, all functions synchronized.

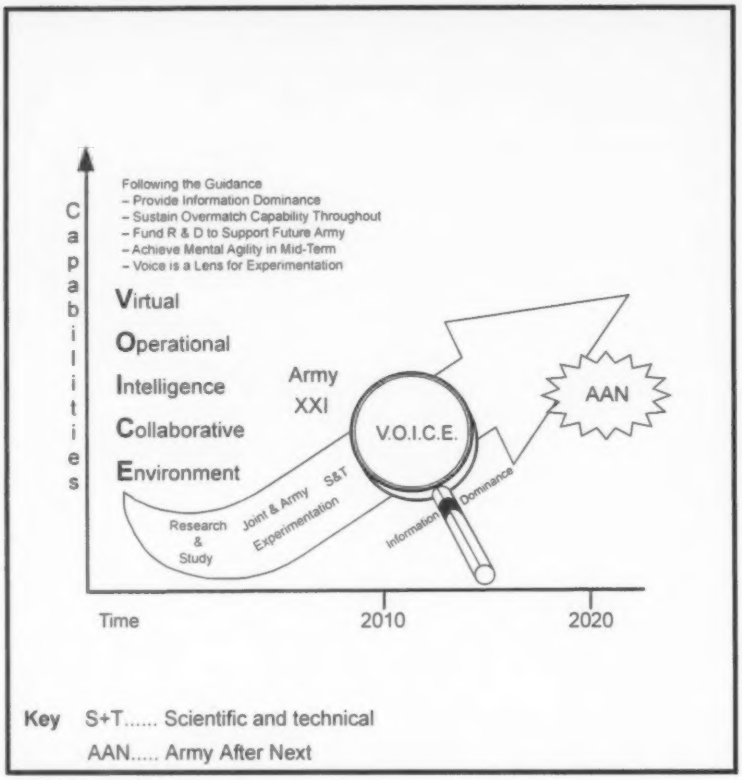


Figure 4. Transforming Army Intelligence.

- **Collaborative**. All agencies, all echelons, tactically tailored, split-based.
- **Environment**. Training, planning, routine, and crisis action functions fully integrated.

The long term (FY11 through FY25) focuses on the integration of IEW systems with command, control, and communications (C^3) systems into one C^3-IEW "system of systems." This system will carry out the presentation, management, collection, processing, dissemination, transport, and denial of battlespace information. These capabilities will come from current and planned technology-based initiatives.

Conclusion

America's Army is the world standard for military excellence and joint warfighting and will remain so into the 21st century. We acknowledge that current overmatch allows us to accept prudent risk in the near term. It is critical that we seize this opportunity to prepare for the next century, just as intelligence visionaries in the 1970s and 1980s prepared us for operations in the desert. We must further strengthen our capabilities by taking advantage of improved technology and the innovation of our people to prepare our forces.

The Army's IEW modernization efforts will continue to guide the transformation of new concepts and new technologies into warfighting capabilities and allow Army commanders to achieve dominant battlefield awareness. By 2010, Army intelligence will achieve an order of magnitude increase in overall capability as it fields objective collection, processing, exploitation, and dissemination systems. In the long term, we will provide the IEW force for the Army After Next.

Endnotes

1. Department of the Army, **Army Modernization Plan**, 1998, page 3.

2. *Editor's Note: A more comprehensive discussion of the patterns of operation and the seven tasks mentioned later in this article can be found in a serialized article by Captain Neal Wegner. It appeared in the April-June 1996, July-September 1996, and January-March 1997 issues of* ***MIPB****. Those issues are on our Internet web site at http://138.27.35.36/MIPB/mipbhome/welcome.htm or just http://138.27.35.36, then select MIPB.*

3. The idea of spiral development is to design-a-little, build-a-little, test-a-little. It describes a development process which has risk identification, assessment, and resolution as the basis for iteratively developing systems. Spiral development identifies risks associated with each stage of the development process and plans and executes their resolution. High-risk aspects of the process are identified and resolved early to minimize their potential impact on the development effort. Developers may not examine aspects with lower risk in as great of detail early on, since their resolution will not be as costly to the entire effort.

Colonel Alfred H. Elliott, III, is Chief of the Intelligence Electronic Warfare/Command and Control Countermeasures Division, Office of the Deputy Chief of Staff for Operations and Plans, Department of Army. During his 29-year career, Colonel Elliott has served with Infantry, Armored Cavalry, Aviation, and Intelligence units throughout the United States, Germany, and the Republic of Vietnam. He has a Bachelor of Arts degree in Government and Law from Lafayette College and a Master of Science degree in Business Administration from Our Lady of the Lake University. He is also a graduate of the Infantry Officer Basic Course, Armor Officer Advance Course, Fixed and Rotary Wing Flight Schools, Command and General Staff College and the Army War College.

MI Force Structure

by Lieutenant Colonel
Robert G. Gutjahr

Military intelligence is facing one of the greatest challenges in its history as it draws down its end strength and force structure, reinvests scarce resources in modernization and readiness, and concurrently improves its capabilities with a battery of cutting-edge systems. Like the rest of the Army, MI's force structure experienced a tremendous transition over the past two years. The Quadrennial Defense Review, the MI Branch Functional Area Assessment (FAA), and the subsequent Military Intelligence Reduction Initiative (MIRI) have reduced the total MI force by 4,095 spaces. The MI Force, as of July 1998, stands at 26,428 Active Component (AC), 13,257 Reserve Component (RC), and 5,166 civilians. MI reductions and end strengths are commensurate with the rest of the Army. By fiscal year 2003 (FY03), the Army will draw down to an end strength of 480,000 AC, 530,000 RC (to include U.S. Army National Guard (ARNG) and the U.S. Army Reserve (USAR)), and 218,000 Department of the Army Civilians (DACs).

Restructuring for the Future

The Army is at a crossroads in its force structure. It must be capable of conducting two major theaters of war (MTWs), continuing its global forward presence to support the national military strategy (NMS), and yet avoiding the inherent imbalance risks associated with continued downsizing. [Its strategy to attain these objectives is Total Army Analysis (TAA), an objective, doctrine-based process which establishes the total Army force structure to support the NMS as it is articulated in the Defense Planning Guidance.] Unlike previous TAAs, TAA 07 is the first to employ capabilities-based, threat-adaptive requirements (mission task-organized forces or MTOFs) to clarify the Army's force structure requirements and ultimately reduce authorized level of organization (ALO) shortfalls. As in the past, TAA will consider the Army's requirements for a two-MTW scenario. However, the current iteration will also assess the force structure requirements necessary for executing smaller scale contingencies, to include peacekeeping operations and humanitarian assistance, homeland defense, a strategic reserve, a base generating force, and a base engagement force. MI plays a primary or supporting role in all of these MTOFs, and will be an integral part of the total force.

The **Intel XXI Study**—commissioned by the Deputy Chief of Staff for Intelligence (DCSINT) and approved by the Chief of Staff of the Army (CSA)—will complement our efforts in TAA. It will provide recommended solutions to the challenges facing the MI force structure and the way our branch does its business. Ultimately, this study, led by Brigadier General Wayne M. Hall, will provide the framework for the next Intelligence Branch FAA that will implement these recommendations and integrate them into force structure requirements identified in the TAA.

Despite its myriad mission requirements around the world, the total MI force structure will not grow in the near future. Like our sister branches, we are relying on systems technology, digitization, and the increasing presence of the RC called to active duty to make the difference. Army XXI and our MI units in the 4th Infantry Division at Fort Hood, Texas (the EXFOR), present the ultimate snapshot of our digitized future. With the exception of the tactical unmanned aerial vehicle (TUAV), all MI systems in this division have basis-of-issue plans and are on schedule for projected fielding. MI technology clearly demonstrates the adage that "if you build it, they will come." In the immediate future, critical systems will provide the foundation for our echelons corps and below (ECB) force structure, systems such as the—

- All-Source Analysis System (ASAS).
- Common Ground Station (CGS).
- TUAV.
- Division Tactical Exploitation System (DTES).

Multi-Component Structure

Paramount to the Army's success in the future is the seamless integration of the reserve and active components. In FY99, the Army will activate two AC divisions that will include ARNG enhanced separate brigades. This is the centerpiece for the Army's Multi-component Policy, which is creating units with authorized personnel from more than one Army component. [MI will play a major role in the multi-component structure designed to enhance AC-RC integration, improve readiness and resource posture, optimize the unique capabilities of each component, and improve documentation.] The 203d MI Battalion (Technical Intelligence), Aberdeen Proving Ground, Maryland, will become MI's first multi-component unit in FY01 when it combines with the 372d and 383d TECHINT Companies (USAR). Other intelligence organizations at both ECB and echelons above corps (EAC) will eventually convert to multi-com ponent status when the Army implements the MIRI and FAA initiatives.

Critical Challenges

Across the force, MI has some unique and critical challenges, and the Army Staff is exploring new options to redress long-standing problems. Language readiness is of paramount concern to the DCSINT and the Chief of Staff, and studies undertaken last year to evaluate Army language requirements, linguist distribution, and language training will reach fruition this summer. Depending on the DCSINT's recommendations and the findings of the **Intel XXI Study**, MI force structure may change to reflect a more efficient use of this valuable resource. Already, USAR linguist battalions are deactivating and converting to companies for better modularity and deployability.

The U.S. Army Intelligence and Security Command largely comprises table of distribution and allowances (TDA) units. INSCOM will convert many of these EAC organizations to table of organization and equipment (TOE) units in FY01, improving their viability and playing in future TAAs. Due to downsizing decisions in TAA 05, the corps tactical exploitation battalions (TEBs) and their missions are migrating from the AC to the RC. The deactivation of the 163d MI Battalion (TE), Fort Hood, Texas, and 14th MI Battalion (TE), Fort Lewis, Washington—in III and I Corps, respectively—will create tremendous demands on the National Guard TEBs, which will activate in FY99 and FY00. The Army's growing requirements for counterintelligence (CI) and human intelligence (HUMINT) personnel will focus heightened scrutiny on the readiness of INSCOM EAC units and these TEBs.

With so many rapid changes to force structure, the Headquarters, Department of the Army (HQDA), is now working closely with the Army major commands (MACOMs) on the status of existing units and those that are activating or converting. The Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) now scrubs the activations and conversions of units in every component in quarterly Force Validation Committee (FVC) meetings. This will ensure that these organizations begin life with readiness levels of C-3 or better. FVCs facilitate a dialogue between HQDA and the MACOM to transition the TAA force from program to execution. Monthly Readiness Reviews (MRRs), the HQDA-collated overview of battalion unit status reports (USRs), are also receiving greater emphasis and facilitating the dialogue between the DCSOPS and respective MACOMs to address both systemic and isolated readiness issues. Every MI unit that reports a C-4 rating or worse now undergoes a detailed review of its force structure and logistics issues. Commanders who report such ratings will no doubt receive follow-up telephone calls from their MACOM headquarters to resolve any issues.

Final Thoughts

As MI continues to evolve and change to support its requirements, force structure will follow suit. It has been a turbulent two years for all individuals working force structure issues in the MI community. We thank you for your enthusiasm, dedication, and professionalism in this very esoteric world where we build and modify units to make MI one of the most efficient and modern branches in the Army. Please call me if you have any questions or concerns. We must build and maintain the future force smartly and correctly.

Endnote

1. **AR 220-1** describes the readiness levels.

Lieutenant Colonel Gutjahr is the Organizational Integrator at Headquarters, Department of the Army, Deputy Chief of Staff for Plans and Operations (DCSOPS) DAMO FDI. Before his current position, he was Commander, 297th MI Battalion, and served as a Presidential Communications/Intelligence Officer for the White House Communications Agency from 1993-1995. LTC Gutjahr served as Operations Security Officer for the Office of Emergency Operations under the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASDC^{3}I). While assigned to the 470th MI Brigade, Republic of Panama, he served as a Company Commander and later as Battalion Executive Officer. He served in many tactical positions from 1979 through 1990, primarily as the intelligence staff officer or a company commander. LTC Gutjahr graduated from the United States Military Academy with a Bachelor of Science degree in Engineering. He earned a Master's of Military Art and Science (MMAS) degree from the School of Military Arts and Sciences at the Command and General Staff College. Readers can contact him at (703) 697-3970, DSN 223-3970, or via E-mail at gutjahrg@hqda.army.mil.

THE INTELLIGENCE FUSION FAMILY

by Colonel Lawrence G. J. Arrol

The Army, like the rest of the Armed Forces, is at a strategic crossroads. The dangers we face today and, consequently, the missions we expect to perform are more diverse than they were in a bipolar world. The operational capabilities needed now are different from those in the past and those that the future will require. Nevertheless, the commander's intelligence needs remain constant:

- Knowledge of the enemy's strengths, weaknesses, composition, disposition, and intentions.
- Weather and its effect on friendly and enemy capabilities.
- Terrain and its effects on maneuverability, cover, concealment, and lines of communication.
- Key or decisive terrain.

Relevant information and intelligence are still the cornerstones to accomplishing today's diverse missions. They enable commanders to coordinate, integrate, and synchronize combat functions on the battlefield, thus gaining the advantage of position (maneuver) and massing of effects (firepower) as well as an information advantage over the adversary.

The emerging systems under the purview of the Project Manager (PM) Intelligence Fusion are essential to providing this common, relevant, intelligence picture of the battlespace to combat commanders at all echelons. These systems include the All-Source Analysis System (ASAS), the Joint Collection Management Tools (JCMT), the Counterintelligence/Human Intelligence (CI/HUMINT) Information Management System (CHIMS), and the Integrated Meteorological System (IMETS). This article will address the following topics:

- Intelligence end products from each system.
- Need to support Army intelligence units worldwide with standard products.
- Year 2000 problem, commonly referred to as Y2K, and how it affects intelligence fusion.
- Future evolution of intelligence products.

Intelligence Fusion Systems

ASAS continues to be the Army's "flagship" intelligence fusion system; it correlates and fuses all available intelligence data to provide the commander with the relevant intelligence needed to understand enemy deployments, capabilities, vulnerabilities, and potential courses of action (COAs). To remain relevant, an all-source capability must be flexible enough to adapt to changing user needs, threats, operational missions, and technologies. The planned upgrade of ASAS Block I systems to Block II, and ultimately to Block III (beginning in fiscal year 2001 (FY01)) reflects this philosophy. The goal of the Product Manager for ASAS Software (ASAS-SW), Lieutenant Colonel Gregory Fritz, is to continue the evolution of ASAS software as change dictates.

The Army first introduced the ASAS to the force in 1993 with eleven rugged unit sets fielded to high-priority corps and divisions. Because of the demand from the units without ASAS, the Chief of Staff of the Army approved a commercial off-the-shelf (COTS) surrogate. The surrogate runs standard ASAS software to provide an ASAS capability to units not previously scheduled to receive ASAS until after the year 2000. The Army designed the Block I ASAS for force-on-force operations on the plains of Europe. Today, however, the Army must perform a much larger variety of roles in diverse theaters and, consequently, ASAS must now support those additional missions. The Vietnam conflict was signals intelligence (SIGINT)-intensive and Operations DESERT SHIELD and DESERT STORM were imagery intelligence (IMINT)-intensive; while Grenada, Panama, and Bosnia were, and are, human intelligence (HUMINT)-in-

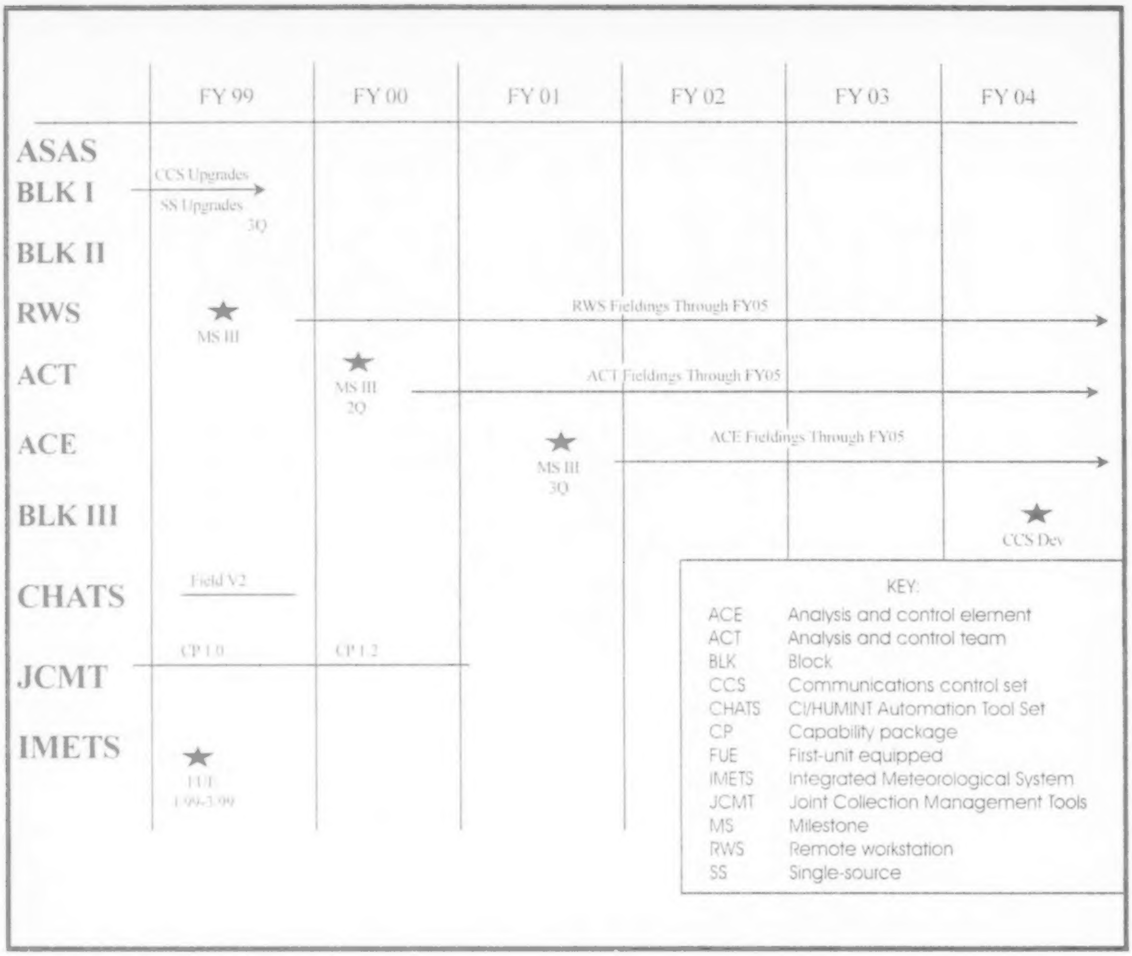


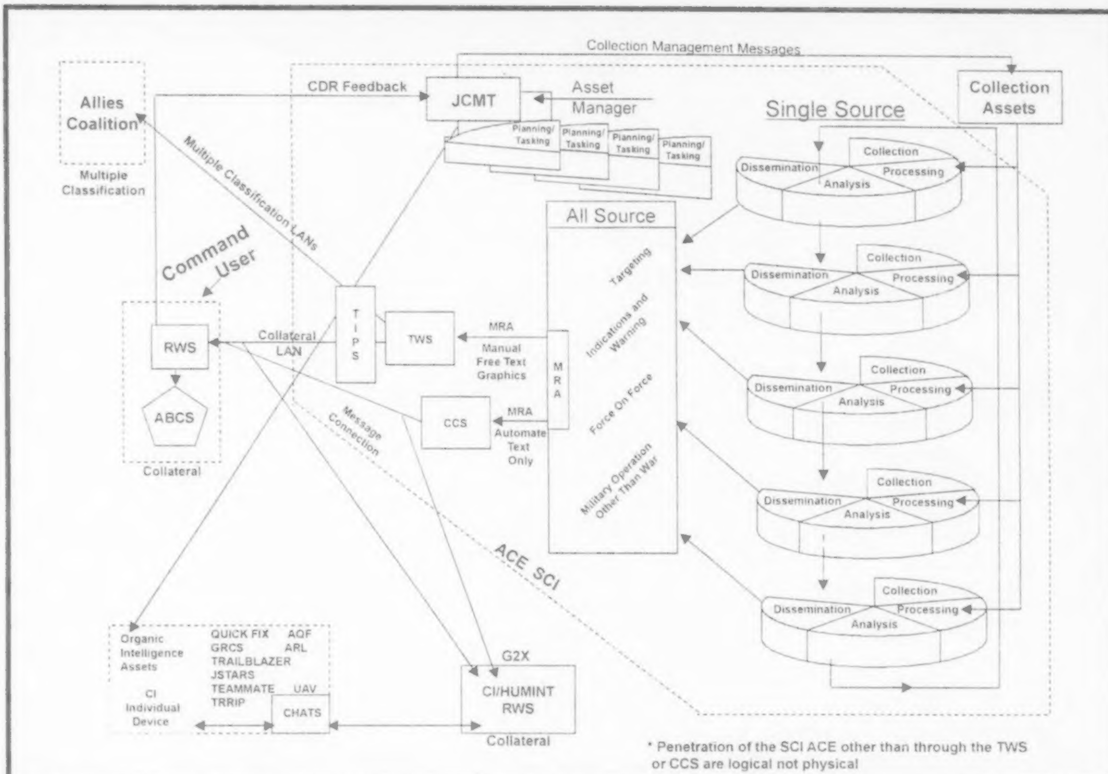
Figure 1. Fusion Family Systems Major Events.

tensive. Today, ASAS supports a full spectrum of tactical scenarios from peace to war.

ASAS is the only Department of Defense (DOD) Acquisition Category 1 (ACAT 1) intelligence system. This means the product is subject to extensive scrutiny by the Congress and the Office of the Secretary of Defense. This oversight assures that the use of the appropriated funds is consistent with the desires of the Congress. The existing acquisition process for software development programs has difficulty matching the currency of products available in the commercial market. "Corporate America" has compressed their product development cycles. This is a reversal of the DOD's historical role in systems development and has been the catalyst for acquisition reforms. Recent initiatives may cause treatment of software-intensive systems as capital investments, which can facilitate more frequent software deliveries to MI units. For example, the Intelligence Fusion Program Office has a six-month frequency-of-release target for new software capabilities with increased functionality. In addition, the PM ASAS-SW works closely with the ASAS user and test community to reduce the time and cost associated with the fielding of software products.

Joint Collection Management Tools (JCMT)

The JCMT is the DOD Intelligence Information System (DODIIS)-migration system for all-source collection management. JCMT is the standard software product that national, theater, and tactical organizations of all Services will use. The Army is the designated executive agent for its development while the Defense Intelligence Agency (DIA) establishes its requirements, funds, and priorities. JCMT provides tools for gathering, organizing, and tracking intelligence collection requirements for all intelligence disciplines across all the Services and DOD agencies.



KEY:

ABCS	Army Battle Command System	MRA	Message release authority
AQF	Advanced QUICKFIX	OSINT	Open-source intelligence
ARL	Airborne Reconnaissance Low	SCI	Sensitive compartment information
CCS	Communication Control Set	SIGINT	Signals intelligence
CDR	Commander	TIPS	Tactical Intelligence Products Server
GRCS	Guardrail Common Sensor	TRRIP	Thearter Rapid Respond Intelligence Package
IMINT	Imagery intelligence	TWS	Tactical Workstation Station.
JSTARS	Joint Surveillance Target Attack Radar System	UAV	Unmanned aerial vehicle
MASINT	Measurement and signature intelligence		

Figure 2. All-Source Analysis System Family of Products.

The JCMT system recently completed a successful operational test. The U.S. Central Command (CENTCOM) J2 stated that JCMT contains 85 percent of the combat commander's requirements for collection management and that CENTCOM (the operational evaluators for the system) did not want to go to war without it. The Product Manager JCMT, Lieutenant Colonel John Tidd, is now planning to add additional tools required by the scientific and technical community to address maneuver commanders' emerging requirements.

CHIMS and CHATS. The intelligence community can aspire no higher than to protect forces placed in harm's way. The CHIMS—a direct outgrowth of the European Theater-developed Rapid Response Intelligence Program (TRRIP)—does just this. The Product Director, CI/HUMINT, Lieutenant Colonel Albert Garcia, is fielding the first increment of CHIMS, the CI/HUMINT Automated Tool Set (CHATS). CHATS is the first automated system introduced at a soldier level for tactical HUMINT teams. The CHATS' first mission is that of force protection, while at the same time contributing to the all-source intelligence situation. Established in June 1996, this CI/HUMINT office is already fielding its first systems.

Integrated Meteorological System (IMETS)

The final system in the Intelligence Fusion Project Office is the IMETS. This system provides battlefield weather information and is the only DOD system that the Army developed and the U.S. Air Force operates. The system provides cru-

cial data to tactical operations and can report micro-scale weather focused directly on the area of operations.

Standardized Products

As PM, Intelligence Fusion, I focus on providing a set of analytic and command and control (C^2) tools to intelligence analysts in both joint and combined operations. Additionally, I strive to have the intelligence fusion products not only recognized, but also used by all the Services and DOD agencies. Central to that effort is the assurance that the tools are relevant, applicable to the entire Army, and not only to the needs of a single unit. When units use standard Army products, they ensure interoperability wherever they deploy. Command-unique solutions, while immediately gratifying, are generally insupportable from a total Army logistics perspective because they tend to be short-lived. In the current climate of shrinking resources, when a unique system develops with value to the entire Army, we must incorporate it in a standard product baseline and the Training and Doctrine Command (TRADOC) must assess it.

If a unit chooses to use a standard Army product in quantities greater than the Table of Organization and Equipment (TO&E) systems authorization, they can often leverage the standard Army sustainment structure and be assured of compatibility and interoperability with other units throughout the Army. Additionally, when the Army selects intelligence fusion products, there is an assurance of architectural compatibility with any currently supported Army intelligence fusion system. Horizontal and vertical interoperability is imperative.

Year 2000 (Y2K) Problem

The first priority of DOD is the year 2000 (Y2K) computer problem. This Y2K problem affects a few fielded intelligence fusion products. In a sequence mandated by DOD, the Army will replace the affected ASAS systems: the Block I ASAS Communications Subsystem and the Single-Source Processor. We will likewise replace the affected Block I IMETS. The Y2K problem does not affect any other fusion products.

Future Focus

What is the future? The primary focus for the Project Office is to field the suite of intelligence fusion systems to the First Digitized Division (4th Infantry Division (Mechanized)) by FY00. As the Army moves into the future, we must ensure the rapid analysis and dissemination of relevant information to the force. Whether the mission is force-on-force or stability and sustainment operations, the role of intelligence fusion products does not fluctuate—giving the commander the superior information advantage of a nearly instantaneous and complete battlespace picture, while protecting the force. To maintain currency in a rapidly changing environment, we must continually upgrade and improve those systems that are in the force. Success in acquisition is evolution, not revolution. As such, the Army intelligence force will evolve into a more capable and joint-interoperable "system of systems."

Colonel Arrol is currently the Project Manager Intelligence Fusion. His past assignments include: Commander, A Company, The U.S. Logistics Detachment 4, Sinop, Turkey; Cryptologic Staff Officer, Continental United States (CONUS) MI Group National Security Agency (NSA); Operations Officer, U.S. Army Field Station Berlin; Readiness Officer, Project Manager, Intelligence and Electronic Warfare (IEW); Executive Officer, Program Executive Office, IEW; Product Manager, TRAILBLAZER, TACJAM, and Ground-Based Common Sensor (GBCS); and Program Executive Office IEW Liaison Officer, G2, Third U.S. Army, Saudi Arabia. He has a Bachelor of Science degree in Electrical Engineering from Wayne State University and a Master of Engineering Administration degree from George Washington University. He is a graduate of the U.S. Army Command and General Staff College, Program Managers Course, Defense Systems Management College, and the U.S. Army War College. Readers can contact the author via E-mail at larrol@asaspmo.belvoir.army.mil and telephonically at (703) 275-8110 and DSN 235-8110.

All-Source Analysis System

by Lieutenant Colonel Gregory J. Fritz and Lieutenant Colonel Michael E. Montie (USA, Retired)

The All-Source Analysis System (ASAS) is the Army's flagship tactical intelligence fusion and dissemination system. It serves as the ground commander's all-source central processing unit for compartmented and collateral information received from intelligence collection systems and front-line soldiers. ASAS provides commanders and staffs from echelons above corps (EAC) through battalion with automated, intelligence information-system support and, using the processed intelligence, creates a common understanding of the enemy and terrain on the battlefield.

ASAS Block II Development

ASAS, the primary command and control (C^2) system for the Intelligence and Electronic Warfare (IEW) functional area of the Army Battle Command System (ABCS), is one of four programs under the oversight of the Project Manager, Intelligence Fusion. The Block I ASAS program provided the first generation of intelligence automation capability to the user. The current Block II program is developing a far more capable second-generation suite of systems. ASAS Block II's design provides, in three phases, a suite of modular systems developed under a common architecture and compliant with the Common Operating Environment (COE) of the Defense Information Infrastructure (DII).

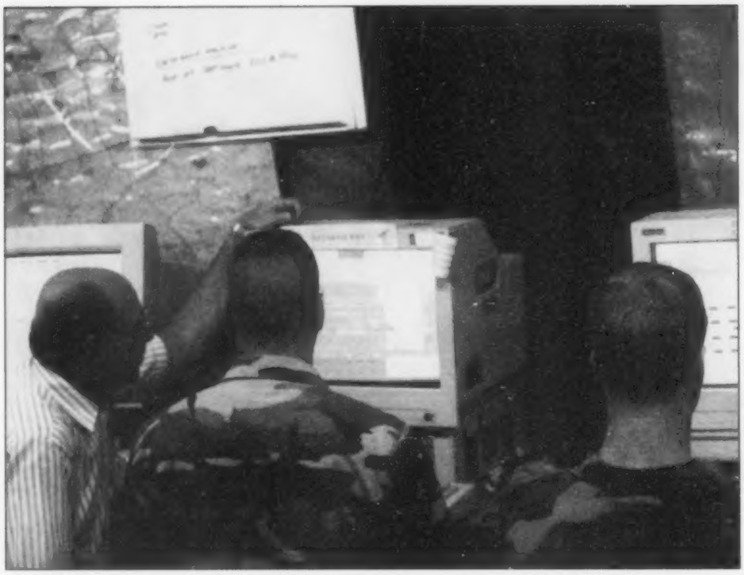
The first phase of Block II developed the second-generation Capability Package Single Source (CPSS) software system. In Phase 2, the second-generation (v3) Remote Workstation (RWS) was developed, and is now under preparation for operational testing. ASAS Block II system currently is in Phase 3, developing the second-generation All-Source software system for the 4th Infantry Division (Mechanized) (4ID(M)), the "First Digitized Division" (FDD). The Block II RWSv3 successfully participated as the brigade's baseline ASAS in last year's Task Force XXI (TF XXI) Advanced Warfighting Experiment (AWE), and as the brigade and division baseline for the Division XXI AWE (DAWE) completed in November 1997. ASAS Block II systems will form the intelligence baseline for the FDD.

Technical Characteristics

The Defense Information Systems Agency (DISA) developed the COE to serve several purposes. DISA describes the COE as a mission- and application-independent construct that defines an architecture, an approach to interoperability, a collection of reusable software, a software infrastructure, and a set of guidelines and standards. In fiscal year 1996 (FY96), the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD C^3I) directed that Department of Defense (DOD) C^2 achieve full compliance with the COE to produce an environment which minimizes system development costs and interoperability issues.

Three software layers comprise the COE: the Kernel layer, the Infrastructure Services (data exchange) (ISDE) layer, and the Common Support Applications (CSA) layer. Individual system programs such as ASAS develop and integrate a Mission Applications (MA) layer that uses the three common layers to support the system's mission-specific functional capabilities. DISA has published a COE Integration and Run Time Specification (IRTS) that provides the guidelines needed by application system developers to ensure their systems integrate with the COE common layers.

The many DOD systems that must operate in compliance with the COE have been under devel-



John Walker, a Lockheed-Martin contractor, instructing a 104th MI Battalion soldier at the DAWE.

opment for varying periods. Some systems, such as ASAS, are quite mature. We must modify them technically in significant ways—and at significant expense—to achieve full COE compliance. While this is a short-term expense, the long-term ease of operation for the users ensures the investment is cost-effective.

To accommodate the reality of budget limitations, DISA has defined eight levels of run-time environment compliance to allow systems to achieve compliance in an orderly, efficient manner. These levels of compliance are for standards, network, workstation, bootstrap, minimal COE compliance, intermediate COE compliance (Level 6), interoperable compliance (Level 7), and full COE compliance (Level 8). On 4 May 1998, ASAS became the first Army system conditionally certified as having achieved intermediate COE compliance (Level 6).

Human-computer interfaces with a common look and feel have been mandated to ensure that operation of ABCS systems (and other COE-compliant systems) is as standardized as possible for the user. Both UNIX™ and Windows NT® implementations should be in place by the time the Army has outfitted the FDD.

As with all other digital systems, ASAS must ensure that its systems are free of the Year 2000 (Y2K) anomaly created by the use of two digits to express the calendar year in system software. ASAS Block II systems are under development with Y2K-compliant software; they are tested routinely to ensure that no anomalies are included inadvertently as other software modules are incorporated. The current defining documents for Y2K testing and compliance are the **Army Tactical Command and Control System Criteria for Y2K Testing**, and the **U.S. Army Year 2000 (Y2K) Action Plan Revision II**.

For ASAS Block I systems now in the field, upgrades are underway. The Intelligence Fusion Program Management Office (IF PMO) is carrying out a hardware-software upgrade program for the Block I AN/TYQ-40 Communications Control Set (CCS). This upgrade will be completed during the first quarter fiscal year 1999 (1QFY99). The ASAS Block I Single-Source, All-Source, and RWS software packages are receiving upgrades from the U.S. Army Communications-Electronics Command (CECOM) Software Engineering Center. The scheduled completion for these upgrades is by the end of 2QFY99. Upgrades for the Block I Compartmented ASAS Message Processing System (CAMPS) will be in place by the end of 3QFY99.

First Digital Division

The Army has committed to the transformation of the 4ID(M) into the FDD by the completion of FY00. The transformed division will participate in the FDD Digitized Capstone Exercise (DCX) during the year 2000. The FDD will contain a full complement of digitized ABCS functional systems, including—

- ASAS.
- Maneuver Control System (MCS).
- Advanced Field Artillery Tactical Data System (AFATDS).
- Air Missile Defense Warning System (AMDWS).
- Army Global Command and Control System (AGCCS).
- Force XXI Battle Command Brigade and Below ($FBCB^2$) system.

To prepare for operational capability in the FDD, ASAS has maintained a system in the Central Technical Support Facility (CTSF) at Fort Hood, Texas. CTSF has served as an outstanding experimental mechanism for testing interoperability of ABCS component systems, and suggesting solutions to the problems identified before the tactical units receive the systems for AWEs.

ASAS participation in the Task Force XXI and Division XXI AWEs has served as an extremely useful assessment and validation mechanism for ASAS products. The AWEs (and preparation for them) provided an environment for close and continuous interaction be-

tween the developer-contractor team and the user. This interaction assured that technical and training issues were resolved efficiently while still maintaining configuration control of a system scheduled for Army-wide fielding. The practically flawless performance of the RWSv3 throughout the DAWE was a testament to the effectiveness of the process.

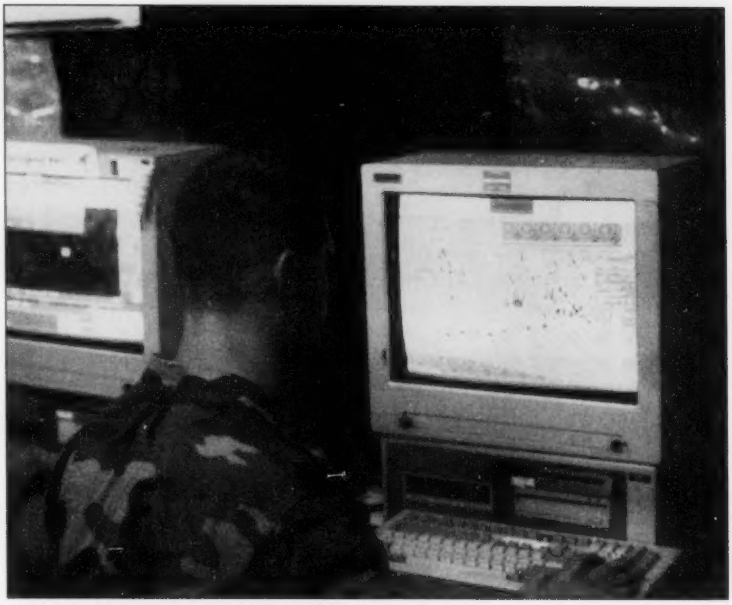
In December, the RWSv3 will undergo operational testing. The Warfighter Rapid Acquisition Program (WRAP) candidate, the Analysis and Control Team (ACT), may undergo testing at the same time. The ACT will serve as the brigade-level intelligence analysis facility.

In support of Army light forces, the ASAS program now experiments with a laptop-based system that will replace the current fielded prototypes with a system that fully complies with the standards and interoperability requirements of the ASAS workstation-based system. As a surrogate, units used ASAS RWSv3-based systems during the Rapid Force Projection Initiative (RFPI) conducted this spring at Fort Campbell, Kentucky, and Fort Benning, Georgia.

Joint and Combined Interoperability

Ensuring that ASAS interoperates with other Army systems is not an acceptable end state, because Army units participate jointly with forces and systems from other Services and agencies. In addition, Army forces operate in combination with other elements of coalition forces. This requires that ASAS achieve a high degree of joint and combined interoperability.

Since the United States must be prepared to engage in combat operations at any time, it does not suffice for all programs and Services to achieve interoperability after all systems have achieved full COE compliance. Budget and schedule constraints will force that condition



104th MI Battalion soldier using the ASAS.

well into the future. Therefore, we must take interim steps to ensure sufficient interoperability is available before all systems can achieve full COE compliance.

In addition to its COE compliance activities, the ASAS program has implemented a number of proactive, bilateral efforts to determine interoperability requirements and standards needed for interface with other Service and agency systems. The efforts of the ASAS program also include ensuring that the intelligence received and provided is in a format and context appropriate for all receiving combat commanders. In addition to the bilateral efforts, the IF PMO is engaged in joint working group efforts created to address horizontal issues affecting multiple Services. One such group effort was the first ASAS Technical Integration Meeting, held at the Lockheed Martin facility in Denver, Colorado. All of these actions are moving as quickly as budget and charter constraints allow.

It is useful to illustrate an example of the technical issues that arise when we address system interoperability. This particular issue happens to be peculiar to intelligence systems. The de facto database standard for exchange of enemy information is the Modernized Integrated Database (MIDB). The defined standard database for ABCS systems is the ABCS Common Database (ACDB). In some areas, the two databases are incompatible. To ensure that this technical issue is transparent to the combat user, representatives of the ASAS team are working with both MIDB and ACDB technical representatives to develop a solution.

Since the Marine Corps and Army represent the DOD's two conventional ground forces, the ASAS program has entered into an agreement to provide an ASAS RWSv3 for the ELB (Extending the Littoral Battlespace) Advanced Concept Technology Demonstration (ACTD). This ACTD will explore ASAS utility for the Marine Corps.

Just as ASAS participates in the CTSF, it also participates in the exercises and interoperability efforts of the Joint Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C^4ISR) Battle Center.

This new facility, created under the purview of the U.S. Atlantic Command (LANTCOM), provides an excellent environment for addressing the practical problems of joint interoperability.

To assure a viable process for achieving coalition interoperability, the IF PMO and the Canadian Department of National Defence (DND) are working together on a compatible program (the Canadian Electronic Warfare Command and Control Program), and have begun efforts to achieve a cooperative interoperability effort. These efforts, which have been ongoing for nearly two years, are serving as the pilot model for future interoperability efforts with the forces of other allied nations.

Conclusion

This has been an attempt to summarize recent progress on the ASAS program, and its plans for the near future. As with all plans, this one represents a snapshot in time that unforeseen international developments and changes in domestic budget priorities can affect. What should be clear, however, is that ASAS fully expects to continue providing quality products which enhance the effectiveness of soldiers and combat units throughout America's Army.

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Looking For The Best

The U.S. Army Special Operations Command (USASOC) and its units are looking for highly motivated, physically fit, airborne-qualified (or willing to go to airborne school), language-speaking (Defense Language Proficiency Test 2/2) military intelligence (MI) soldiers. The USASOC units include the 75th Rangers, 160th Special Operations Aviation, special forces, psychological operations (PSYOPS), civil affairs, and the U. S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS).

USASOC is looking for soldiers in the following military occupational specialties (MOSs):

- 96B (Intelligence Analyst).
- 96D (Imagery Analyst).
- 97B (Counterintelligence Agent).
- 97E (Interrogator).
- 98C (Signals Intelligence (SIGINT) Analyst).
- 98G (Voice Interceptor).
- 98H (Communications Locator/Interceptor).

Service with USASOC is not limited to just Fort Bragg locations but also includes Forts Campbell, Lewis, Carson, Benning, and Stewart/Hunter Army Airfield, as well as Germany, Okinawa, and Panama.

Interested soldiers can contact Sergeant Major Fowler, USASOC Deputy Chief of Staff for Intelligence, by telephone at (910) 432-6207 or facsimile (910) 432-5101, or DSN 239-6207 and via E-mail at fowlerrs@soc.mil. You can also E-mail Sergeant First Class Dodd, USASOC Deputy Chief of Staff for Personnel, at doddj@soc.mil. Come join the small number of MI professionals in the special operations community that are truly—the quiet professionals.

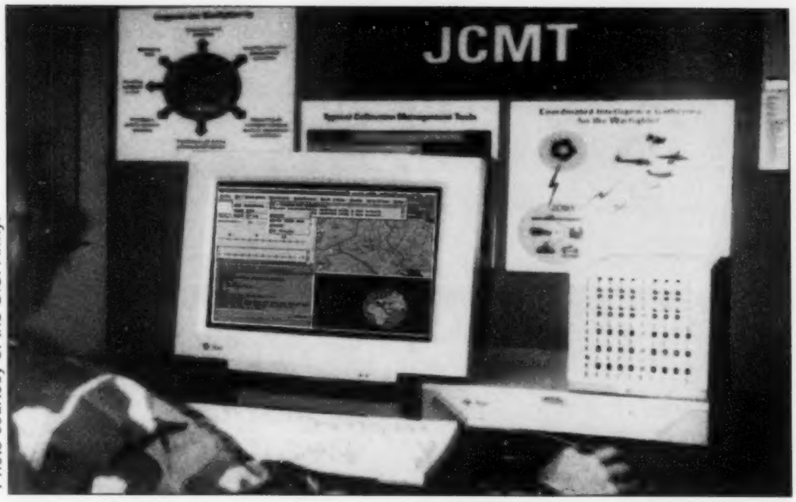


Photo courtesy of the U.S. Army.

Joint Collection Management Tools—

The Combat Commanders' Gateway to National Collection

by Robert L. McKinnon

Joint Collection Management Tools (JCMT) is the Department of Defense (DOD) migration system for all-source, intelligence collection management. Collection managers (CMs) in every Service and at each echelon from the Defense Intelligence Agency to Army divisions will use the system. (See Figure 1.) For the first time, it allows the collection managers at all echelons to—

- Research existing collection requirements and existing reporting.
- Create and monitor new collection requirements.
- Conduct feasibility analysis that results in the selection of appropriate collection assets for a particular task.
- Generate tasking and request messages.

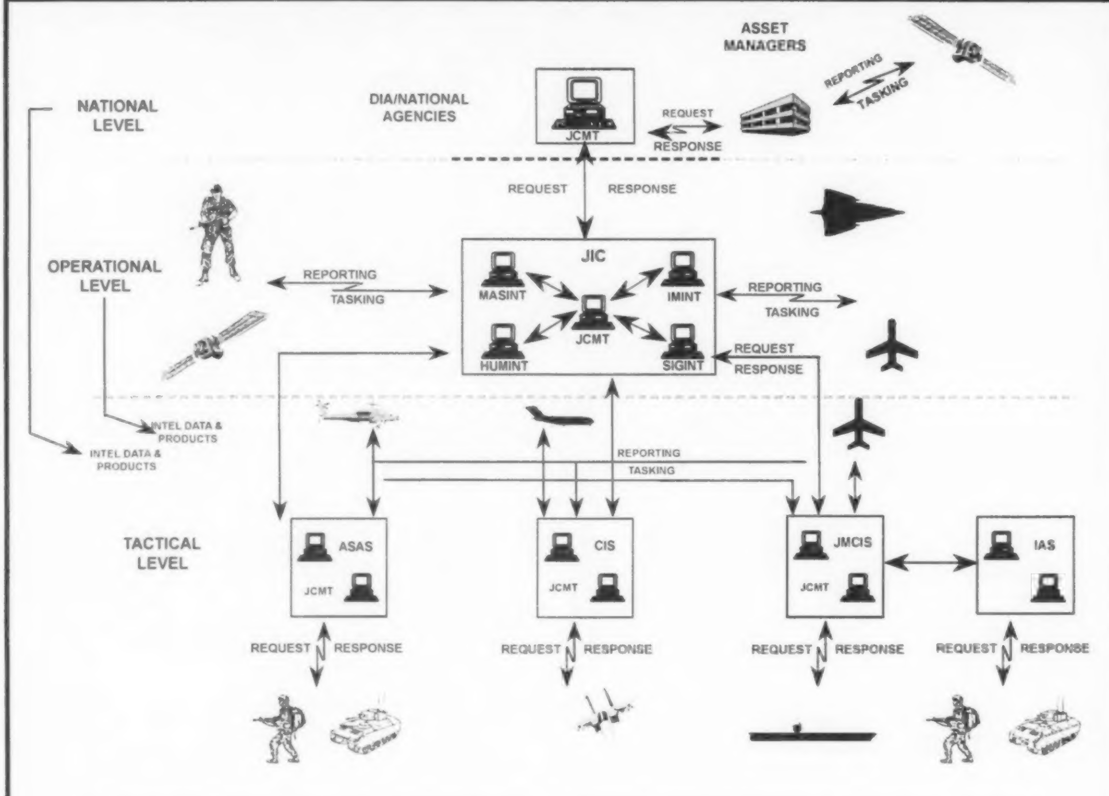
The JCMT currently operates at the Top Secret/sensitive compartmented information (TS/SCI) level.

Software Development

The Product Manager (PM) for JCMT has articulated a strategy that calls for development and delivery of the software in four phases (Capabilities Packages) over a three-year period. These packages offer a collection requirements management application (CRMA), collection requirements management system (CRMS), support to the tactical echelons, and common operating environment compliance.

Collection Requirements Management. Fielding of the JCMT Capabilities Package 1.0 began in March 1998. The primary objective of this current release is to "roll forward" into JCMT the functionality of Defense Intelligence Agency's (DIA) CRMA. The CRMA is a legacy system used by CMs at the national and theater levels working primarily with national signals, imagery, and human intelligence (SIGINT, IMINT, and HUMINT respectively) collectors. Its functionality includes a local requirements registry, robust satellite-borne and atmospheric collector models, and the ability to cross reference, either manually or automatically, requirements, targets, messages, and more.

Collection Requirements Management System (CP 1.1). Delivery of CP 1.1 will begin in May 1999 at the sites that have not yet received CP 1.0. The primary objective of this release is to capture the task list methodology and workflow found in the National Air Intelligence Center's (NAIC) Collection Requirements Management System (CRMS). This functionality will allow a JCMT collection requirements manager to assign and track various tasks, such as the generation of a requirement or the evaluation of raw reporting. Other improvements include changes to the system's human-machine interface (HMI) in order to make JCMT as user-friendly as possible, initiatives to make the system compli-



Key:

ASAS	All-Source Analysis System	JCMT	Joint Collection Management Tools
GCCS-M	General Command and Control System-Maritime	JIC	Joint intelligence center
		MASINT	Measurement and signatures intelligence
HUMINT	Human intelligence	SIGINT	Signals intelligence
IAS	Intelligence Analysis System	TBMCS	Theater Battlefield Management and Control System
IMINT	Imagery intelligence		

Figure 1. JCMT Contingency Operation.

ant with DOD Year 2000 (Y2K) directives, and the development of "JCMT Lite." This last initiative is primarily a JAVA-coded web-based effort to satisfy the needs of those CMs who are constrained in terms of communications bandwidth, such as Navy and Marine Corps CMs deployed at sea.

Support to the Combat Commander. This version (CP 1.2), of the software scheduled for fielding beginning in October 1999, will include several enhancements designed to assist the CM at tactical echelons in planning and executing collection operations. These enhancements include the addition of models for tactical ground- and sea-based collectors and the incorporation of an intelligence synchronization matrix (ISM) format. The models will allow the CM to assess more accurately the capability of a particular tactical asset to collect against a specific target while the ISM will facilitate the synchronization of collection activities with friendly operations in the battlespace area. A further enhancement includes an interface with the measurement and signals intelligence (MASINT) Requirements Database System (MRDBS). This will allow the user to access, generate, and monitor MASINT requirements in a manner similar to the way that JCMT users now manage HUMINT, SIGINT, and IMINT requirements.

Department Information Infrastructure Common Operating Environment (DII COE) Compliance. Capabilities Package 2.0 will be fielded beginning in September 2000. The major improvement planned for this release includes the improvement of JCMT's com-

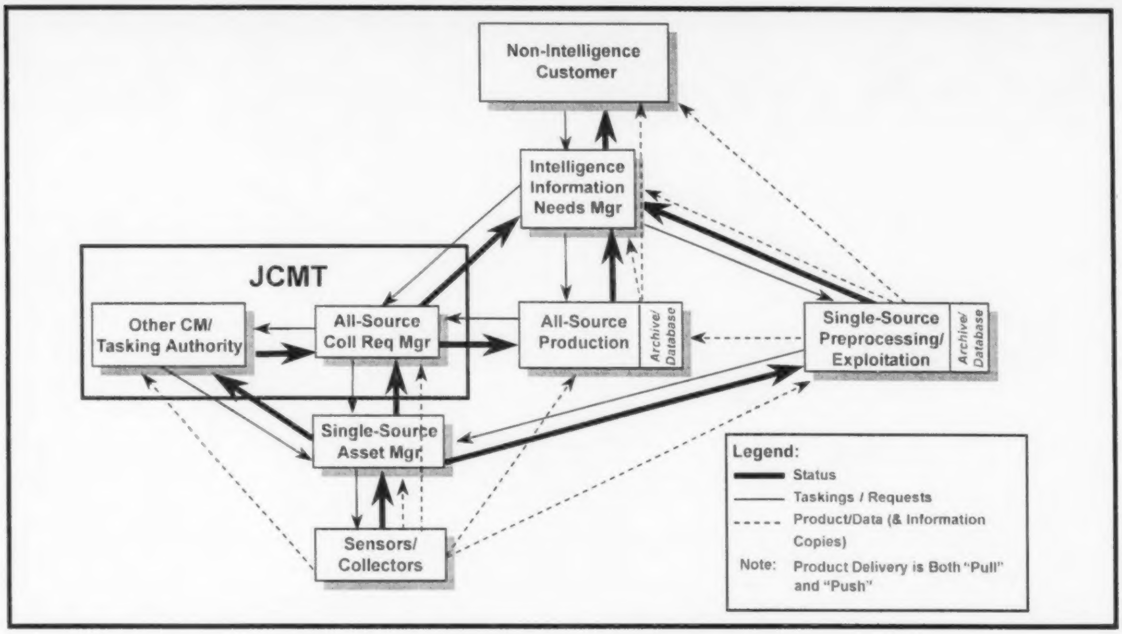


Figure 2. The JCMT Role in Intelligence Architecture.

pliance with DII COE standards. This will enhance the JCMT user's ability to access remote requirements registries, target databases, and product and reports archives. Other improvements include the—

- Replacement of the OILSTOCK map package with the Joint Mapping Tool Kit (JMTK).
- Inclusion of digital terrain elevation data (DTED).
- Incorporation of weather effects on the existing collector models.
- Ability to access, create, and monitor both technical intelligence (TECHINT) and open-source intelligence (OSINT) requirements.

JCMT Fielding Concept

The Army will field the JCMT using a variety of methods depending on the Capabilities Package in question. An installation team from the JCMT Project Management Office (PMO) will issue CP 1.0 to non-tactical organizations. Commands that receive this initial installation will also receive forty hours of on-site instruction in the use of the software. Army tactical users will receive CP 1.0 through the All-Source Analysis System. "JCMT Central," located in San Diego, California, will push subsequent releases to the user community via the Joint Worldwide Intelligence Communications System (JWICS). JCMT Central will also disseminate software patches and updates in a similar fashion to the—

- Modernized Integrated Data Base (MIDB).
- Electronic Intelligence (ELINT) Parameters Listing (EPL).
- National SIGINT Requirements List (NSRL).
- Intelligence Collection Requirements (ICR) database.

The Future

Other enhancements under consideration include a collateral version of JCMT. This version will retain only that functionality necessary to create and monitor local collection requirements and support the management of non-national assets. Other enhancements may include the ability to manage collection requirements for commercial imaging satellites such as LANDSAT and System Probatoire d'Observation de la Terre (SPOT), and the ability to create "conditional tasking strategies." This latter capability allows for automatically cross-cueing other collectors to a particular target's location. (See Figure 2.) These enhancements ensure that JCMT will not only allow the CM to work more efficiently; they will also fundamentally change the way that we conduct collection management throughout the DOD.

Mr. Bob McKinnon was a SETA contractor supporting the PM-JCMT as a software trainer, systems evaluator, and writer. A former 98K (Signals Collection/Identification Analyst) and 97B (Counterintelligence Agent), he holds a Master of Arts degree in International Relations from Boston University. He has been a Senate Intern, a Paralegal, and an Intelligence Research Specialist with the Federal Bureau of Investigation National Drug Intelligence Center. Interested readers can contact Mr. Craig Manley via E-mail at manleyc@asaspmo.belvoir.army.mil and telephonically at (703) 275-8152 or DSN 235-8152.

Introduction to CHATS and CHASIS

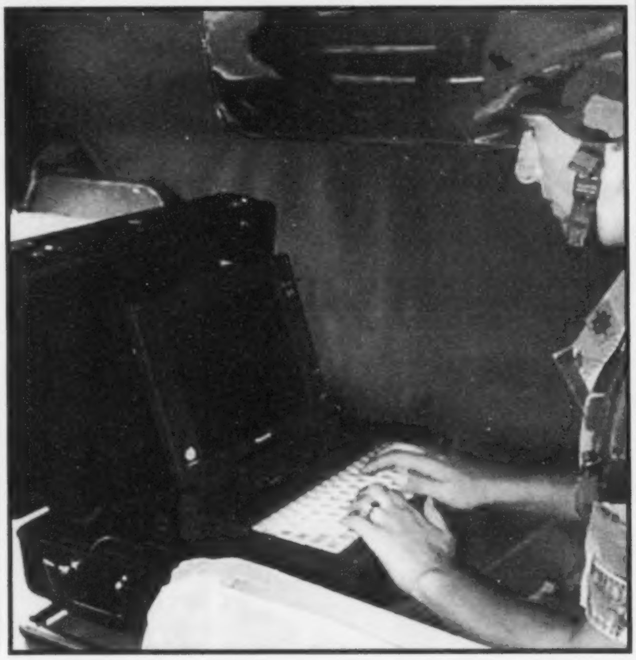


Photo courtesy of the U.S. Army.

by Richard S. Eaton

The heralded success of the Theater Rapid Response Intelligence Package (TRRIP) in Bosnia, Haiti, and elsewhere gave rise to the development of the Army's counterintelligence/human intelligence (CI/HUMINT) Automated Tool Set (CHATS), the newest member of the All-Source Analysis System (ASAS) family. CHATS is a centrally issued Army hardware and software suite designed to meet the unique requirements of CI/HUMINT teams operating in diverse operational environments.

CHATS, the first CI/HUMINT component developed by the Project Manager Intelligence Fusion, is part of a planned four-component CI/HUMINT subsystem within ASAS. When fully completed, the subsystem will provide automated support to CI/HUMINT functions from team-level operators to single-source and all source analysts in the analysis and control element (ACE) or at theater intelligence centers.

CHATS makes CI/HUMINT data readily available in a uniform, digitized format, which the commander can put to immediate use as a force multiplier in risk management and operational decisions. Using the CI/HUMINT All-Source Integration System (CHASIS) as the software baseline, CHATS automates the full range of CI agent and HUMINT collector Intel XXI tasks including:

- Directing and tasking CI and HUMINT assets.
- Collecting intelligence data and hand-held imagery collectors.
- Disseminating intelligence information.
- Supporting CI/HUMINT functions related to force protection and information operations (IO).

The days of painfully slow CI/HUMINT collection management and reporting using outdated tactical voice communications, facsimile or, the more common default, courier are numbered.

Background

CHATS evolved from the fielding of several locally developed systems, most notably the TRRIP. The TRRIP, initially developed in U.S. Army Europe (USAREUR), satisfied a CI special agent's initial need for a small, team-portable system capable of receiving tasking and reporting information over a variety of communications systems. Soon after the USAREUR fielding of TRRIP, multiple variations appeared in other organizations and theaters. As a locally developed system, these TRRIP-like systems had no uniform baseline and were not interoperable with existing or emerging Army or joint intelligence systems, such as ASAS and the Defense Counterintelligence Information System (DCIIS). Thus, CHATS and the ASAS CI/HUMINT Subsystem resulted from a U.S. Army Intelligence Center and Fort Huachuca CI/HUMINT Integrated Concept Team (ICT) process in which systems requirements were generated to drive the development process. These systems will

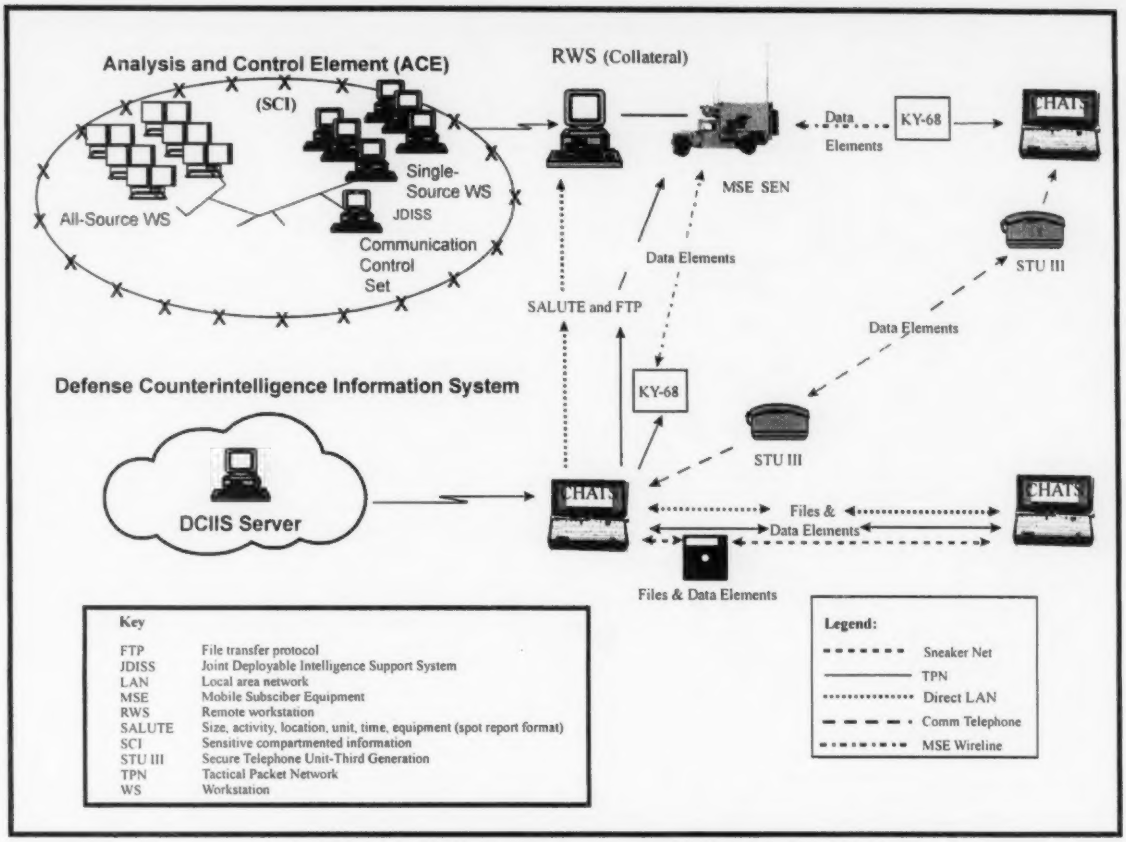


Figure 1. Present CHATS Operational Enviroment.

supply soldiers in the field with an Army-supported and tactically reliable system with compatible hardware and software employable in a variety of intelligence systems, architectures, and environments.

Functionality

With the CHATS/CHASIS package, CI/HUMINT soldiers now have the ability to—

- Manage assets.
- Prepare and report collected information.
- Prepare limited intelligence preparation of the battlefield (IPB) products.
- Conduct limited analysis of information and sources.

Furthermore, they can now rapidly report information collected through CI Force Protection Source Operations (CFSO), CI/counterespionage (CE) investigations, debriefings, interrogations, overt collection, and document exploitation (DOCEX). CHATS fielding and implementation set the path for seamless CI/HUMINT connectivity through ASAS to Army, joint, and national intelligence systems and databases. (See Figure 1.)

Currently, CHATS can communicate using several different tactical and non-tactical communications interfaces. The provided ethernet card allows the CHATS/CHASIS to communicate over a variety of local-area networks (LANs) and wide-area networks. The system can operate over the Mobile Subscriber Equipment (MSE), Tactical Packet Network (TPN), the TROJAN Special Purpose Integrated Remote Intelligence Terminal (TROJAN SPIRIT) network (collateral LAN only), and collateral garrison LANs. The system can also communicate over MSE in a wire-line mode if connected to a KY-68 encryption device. Users can establish collateral communications over commercial systems such as analog telephone networks or International Maritime Satellite (INMARSAT) with a Secure Telephone Unit-Third Generation (STU-III) and appropriate cryptographic key material. Unclassified communications over commercial systems are possible using the included fax-modem card. Plans include an interface for the Single Channel Ground and Airborne Radio System (SINCGARS).

Future additions to the ASAS CI/HUMINT subsystem include the CI and Interrogation Operations Workstation (CI & IO WS), a CI/HUMINT Single-Source Processor (SSP) in the ACE, and a

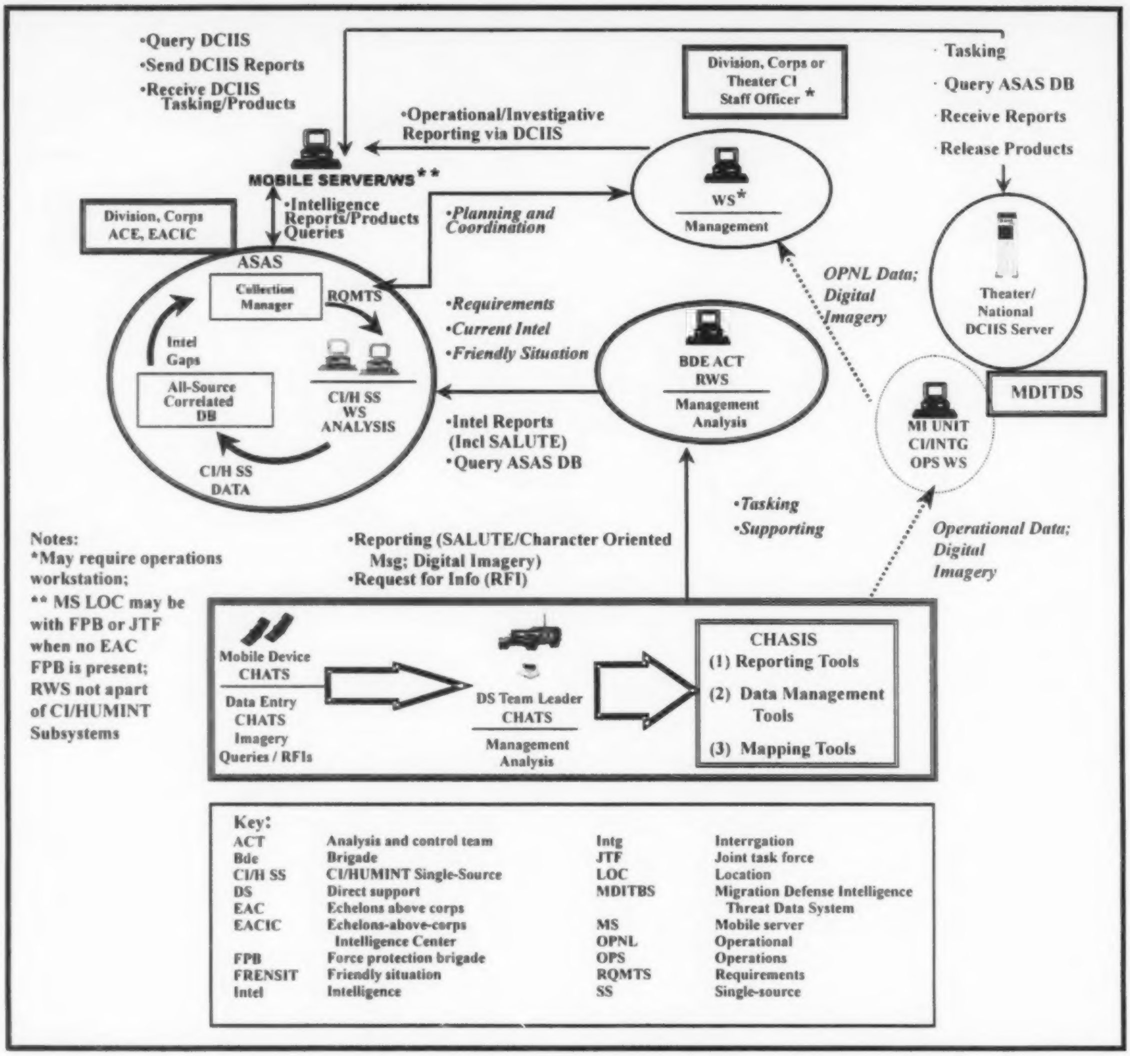


Figure 2. Objective Army CI/HUMINT Information Flow for ASAS/DCIIS.

hand-held CI/HUMINT device for an individual team member. Development and fielding of these items, as well as improvements and additions to the CHASIS software suite, will occur during fiscal year (FY) 1998 through FY03. Additionally, future hardware improvements will include Global Positioning System (GPS) and SINCGARS interfaces.

CHASIS Software

The CI/HUMINT All-Source Integration System is a collection of commercial off-the-shelf (COTS) and U.S. Government-developed CI/HUMINT specific software. The commercial components provide the operating system, common information management and processing functions, and support for the peripheral hardware devices. The Government-developed software provides data management and reporting tools for doctrinal CI/HUMINT reports and mapping tools that are compatible with National Imagery and Mapping Agency (NIMA) digital map data products or user-scanned map images.

The basis for the CHASIS reporting tools are the DCIIS "store and forward forms" package. The DCIIS forms are currently in prototype form. The U.S. Army fielded the prototype store-and-forward forms package with CHASIS nearly one year before the official Department of Defense (DOD) release date. The final versions will be included when approved by the DOD. With the expected changes, future formats will include "tactical" and "strategic" report formats. The store-and-forward forms

allow the user to prepare CI/HUMINT-specific reports and upload them later to a DCIIS server. Additionally, the CHASIS Data Management Tools can also generate a message text format (MTF) SALUTE (size, activity, location, unit, time, equipment) spot report for transmission to ASAS. The mapping tools read both NIMA digital map products and user-scanned map images. This tool provides image enhancement, registration of scanned maps, position tracking, and the overlaying of reference lines and military symbols. Currently, the tool does not have specific functions for interrogation of prisoners of war (IPW). Nevertheless, future development will increase the number of U.S. USMTF compatible CI/HUMINT message formats, including IPW-related reports.

Other future CHASIS improvements will include an IPW bar-coding database tool for "databasing" enemy prisoners of war (EPW), civilian detainees, and captured documents and equipment. Also planned are link analysis and visual investigative analysis (VIA) tools, and a source-management database tool.

Conclusion

The AN/PYQ-3 (V1) CHATS is a long-awaited addition to the ASAS family of systems. It offers CI and HUMINT collectors a first-time-ever ability to communicate intelligence reporting rapidly, directly into the intelligence and electronic warfare operating system. With this ability, commanders will now have timely CI/HUMINT reporting that is immediately actionable, and analysts will have timely reporting that can synthesize CI/HUMINT information into the battlefield picture with little ASAS operator intervention. These capabilities and the CHATS compatibility with DCIIS allow a "push-pull" connectivity from the tactical through strategic level of operations.

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Interrogators—Ready for a Challenge?

Returning from an overseas assignment? Feeling like you have been on station forever? Looking for an exciting challenge and a great opportunity to work your military occupational specialty (MOS) everyday?

The U.S. Army Special Operations Command (USASOC) is seeking interrogator (MOS 97E) volunteers (sergeant through sergeant first class) for SERE/Resistance Training Instructor positions at the U.S. Army John F. Kennedy Special Warfare Center and School (USAJKFSWCS) at Fort Bragg, North Carolina. Applicants must be physically fit, highly motivated, airborne-qualified (or willing to attend airborne school), and SERE (survival, evasion, resistance, and escape) School-qualified (or be willing to attend SERE training).

If you wish to apply or want more information, you may contact Sergeant Major Fowler, USASOC Office of the Deputy Chief of Staff for Intelligence (DCSINT), by E-mail at fowlers@soc.mil or telephonically at (910) 432-6207, DSN 239-6207, or by facsimile (910) 432-5101. You may call the SERE School Operations Noncommissioned Officer in Charge, Staff Sergeant Steinbauer, at (910) 396-6270/8389 or DSN 236-6270/8389. Interested interrogators may also contact the 97E MI Branch Manager at the U.S. Total Army Personnel Command, Sergeant First Class Parmalee, via E-mail at parmeleg@hoffman.army.mil or by telephone at (703) 325-4991, DSN 221-4991.

TACTICAL SIGINT RESTRUCTURED: BEYOND THE GBCS AND AQF

by David Messner and Lieutenant Colonel Patricia J. Bushway

The technology revolution of the past decade has changed the global signals environment. Advances in electronics, computing and telecommunications have limited or negated some current, tactical signals intelligence (SIGINT) capabilities to access, collect, process, and exploit signals of interest. This revolution, coupled with dramatic changes in the future battlefield, dictates some significant changes in our tactical SIGINT systems as well. An extended, multidimensional battlespace; nonlinear, distributed, and simultaneous operations; increased operations tempo (OPTEMPO); and information operations (IO) characterize this future battlefield.

The current solution to address this new environment is the Intelligence and Electronic Warfare Common Sensor (IEWCS) program, comprising the Ground-Based Common Sensor (GBCS) and Advanced QUICKFIX (AQF). However, repeated technological problems and outdated requirements are causing the intelligence community to reevaluate the mission of tactical SIGINT in the future and seek alternative solutions that will accomplish that mission in the most efficient and effective manner.

Reevaluating Tactical SIGINT

The process of reevaluation began last July and August with a Developmental Test/Operational Test (DT/OT) of the GBCS-Light (GBCS-L) platform conducted by the Operational Test and Evaluation Command (OPTEC). The test involved use of the AQF with the GBCS-L and soldiers from the 313th MI Battalion, 82d Airborne Division. The purpose of the test, completed at the OPTEC Test and Experimentation Command (TEXCOM), Fort Huachuca, Arizona, was to:

- Complete an assessment of GBCS capabilities in an operational environment.
- Provide direction for the future tactical SIGINT program.
- Support a production decision for the Mobile Electronic Warfare Support System (MEWSS), a U.S. Marine Corps companion system to the GBCS.
- Contribute adequate information upon which to base a fielding decision for existing GBCS-L platforms to the 82d Airborne, 4th Infantry (Mechanized), and 101st Air Assault Divisions.

Simultaneously, the combat developers at the U.S. Army Intelligence Center and Fort Huachuca reevaluated the requirements for tactical SIGINT and electronic warfare at the division level, and considered the alternatives for providing that capability. That process included:

- Assessment of the capabilities that should be incorporated into the platform.
- Amount, level, and location of signal exploitation necessary to support the tactical commander.
- Requirement for a modular system that can be upgraded to keep pace with technology.

Recognizing that the requirement for SIGINT at the tactical level is an enduring one, the challenge facing the combat and materiel developers as they design and develop the next generation of tactical SIGINT systems revolves around two primary issues. We must provide a timely, accurate, and appropriate picture of the electronic battlefield to division and brigade commanders. We will develop a system that addresses the communications means of the current battlefield, and build into that system the growth capacity that will allow expansion with technology to meet future threats. The solution to these issues must leverage exist-

ing capabilities and incorporate emerging technologies. Most importantly, the system must provide those SIGINT elements identified as essential by tactical commanders and G2s.

This process of determining the necessary SIGINT capabilities at the tactical level is a complicated one that requires input from the soldiers on the ground up to the brigade and division commanders they support. The combat developers must translate the information requirements of those supported commanders into the essential capabilities. This raises issues such as the level of detail needed, weighed against the time and effort required to produce that level of detail, and the degree of exploitation at various levels. For example, is an electronic template that provides basic order of battle information adequate for the fast-pace OPTEMPO of a maneuver brigade on the offensive, or will we need more detail to support the targeting process? Does the extra time needed to provide additional detail negate the value added of having that information? The answers to these questions will have a significant impact on the development of the future tactical SIGINT system and the associated force structure.

Photo courtesy of USATEXCOM IEWTD Electronic Battle Test Division.

Setting up the GBCS-L during the test at Fort Huachuca.

A Projected Solution

We must retain a SIGINT capability at the tactical level. The developmental efforts to date on the GBCS and AQF have laid the foundation for future work.

The combat developers will leverage the lessons learned and technological achievements in the migration to the follow-on system, Prophet. Additionally, Prophet will take full advantage of the innovative methods to accomplish the tactical SIGINT mission developed by U.S. Army Intelligence and Security Command (INSCOM), U.S. Army Communications-Electronics Command (CECOM), and the National Security Agency (NSA). This collaborative effort will address the current threat, and build in the growth potential that will provide the capability to meet future threats. To produce a system that will meet the requirements, it is necessary now to focus the tactical SIGINT program on research and development (R&D). In addition, we must carefully and methodically evaluate the suitability of existing technology and identify the gaps that we can only fill through further development and emerging technologies. Upon completion of this period of focused R&D, the Prophet system, comprising a control element, and ground and air sensor platforms, will proceed to full-rate production and fielding will begin in fiscal year 2003.

David Messner is a Systems Engineer and Technical Consultant for the Program Executive Officer IEW, and has provided engineering expertise to PM Firefinder, PM REMBASS, PM Combat Identification, and PM Signals Warfare. Mr. Messner served in the United States Air Force as a pilot for the Military Airlift Command.

Lieutenant Colonel Pat Bushway is the budget officer for the Department of the Army Deputy Chief of Staff for Operations and Plans, Directorate of Intelligence Electronic Warfare and Command and Control. She has served in a variety of command and staff positions in the 3d Infantry Division (ID), 24th ID, I Corps, and U.S. Forces Korea. Readers can contact her via E-mail at BUSHWPJ@hqda.army.mil and by telephone at (703) 695-6259 or DSN 225-6259.

Joint STARS Common Ground Station

by Colonel Ted Crybiskey (USA, Retired) and Major John F. Beck

The Army is in the midst of massive changes, organizational transitions, and equipment fieldings to support digitization and information-age warfare concepts. A significant challenge is to see through the depth of the battlefield and fuse single-discipline sources analogous information to provide the commander with situational awareness and information dominance over opponents. The Joint Surveillance Target Attack Radar System (Joint STARS) Common Ground Station (CGS) will furnish commanders from brigade through echelons above corps (EAC) with a compact, HMMWV- (high-mobility multipurpose wheeled vehicle) sized focal point to concentrate the power of the Joint STARS radar system, unmanned aerial vehicles (UAVs), and national- and theater-level sensors.

During the recent Task Force XXI and Division XXI Advanced Warfighting Experiments (AWEs), the exceptional performance of the Joint STARS system was singularly critical to the success of U.S. forces. Joint STARS, and its evolving ground station, have participated in nearly every major U.S. military operation since its first deployment supporting coalition forces in Operations DESERT SHIELD and DESERT STORM. Joint STARS illuminates the battlefield for the commander, and the CGS displays that battlefield in easy-to-assimilate graphic views.

The ability to access a wide variety of sensors' output and intelligence broadcasts in near-real-time and to seamlessly provide that preprocessed information to the All-Source Analysis System (ASAS) is a capability undreamed even ten years ago. The Army will field this information age system Army-wide beginning in the fall of 1998 and ending in 2003. Intelligence units from the division and armored cavalry regiment through EAC (Active and Reserve Components) will receive CGSs. With heavy divisions receiving six systems and light divisions receiving five, division commanders will be able to task organize their CGSs to support all facets of the division fight. At corps level, both the intelligence and corps artillery units will receive CGSs.

History

Developed in the 1980s, Joint STARS allowed North Atlantic Treaty Organization (NATO) forces to gain a comprehensive view of the battlefield, including attacking second echelon forces. In the early 1980s, the U.S. Army had an already aging fleet of OV-1D Mohawk side-looking airborne radar (SLAR) tactical reconnaissance aircraft, unable to fulfill deep surveillance requirements. Consequently, the Army, in concert with the U.S. Air Force and the other Services, defined a new joint surveillance and targeting system to support the Services as well as NATO and Allied nations. In 1982, the Office of the Secretary of Defense (OSD) directed the formation of a Joint STARS Joint Program Office, with the Air Force as the lead Service. The OSD charged the Joint STARS JPO with the development of the airborne portion of the system. They designated the Army as the Deputy Program Manager for the joint system and Program Manager for the ground segment. A contract went to Motorola to develop the Ground Station Module (GSM), which has since evolved into the CGS we are fielding today.

System Evolution and Capabilities

The CGS's primary sensor feed remains the Joint STARS AN/APY-3 radar system, providing moving target indicator (MTI) and synthetic aperture radar (SAR) imagery. Additionally, the system receives feeds from a host of sensors (see Figure 1). The CGS receives, displays, and disseminates UAV video from the UAV Ground Control Station and secondary imagery from theater and national sources. Signals intelligence data is received from various intelligence broadcast services via the Commander's Tactical Terminal (CTT); upon fielding beginning in 1999, the Joint Tactical Terminal (JTT)— which transitions to a single, consolidated, integrated broadcast service (IBS)—will replace it.

To disseminate its products, the CGS directly connects to the Army's digitized command and control (C^2) systems, including ASAS, Maneuver Control System (MCS), and the Advanced Field Artillery Tactical Data System (AFATDS). For added flexibility, the CGS will remotely access ASAS over the Mobile Subscriber Equipment (MSE) network. CGS connects to AFATDS via the Single-Channel Ground and Airborne

Radio System (SINCGARS) as an over-the-air datalink. To communicate directly with Army aviation, the CGS includes an improved data modem (IDM) to forward intelligence and receive AH-64D LONGBOW APACHE radar reports.

The CGS has dramatically improved on early versions of the GSM, originally mounted on 5-ton trucks, and supported by 30-kilowatt (kW) generators. Today, the system is on one HMMWV, supported by a 10-kW generator, and includes the capability for on-the-move operations. A second support HMMWV, with generator, completes the CGS system. Six soldiers, military operational specialty (MOS) 96H (Imagery Ground Station Operator) operate the CGS. The move to the HMMWV configuration provides full mission capability and increased mobility, as well as improved air and sea deployability. Through advances in technology and miniaturization, the system has increased in both processing speed and data storage (from 80 megabytes to 78 gigabytes)—a capability several orders of magnitude over that of the earlier GSM configurations. Development of the CGS was one of the Army's first efforts in spiral development[1] and streamlined acquisition.

Building on soldier feedback and experience gained through operational deployments, the CGS has continually improved to meet the increasingly complex requirements of the digital battlefield. The deployments and exercises include Operations DESERT STORM, JOINT ENDEAVOR I and II, the Korean Winter Training Exercise, All Services Combat Identification Evaluation Team (ASCIET), and numerous other field exercises. The Army designed the system using an open architecture, allowing for the rapid insertion of commercial off-the-shelf (COTS) technology and components at the system level. This cuts costs, saves time, and allows the system to evolve to meet preplanned product improvements (P^3I). Joint reviews with the Army, detailed analysis of current and emerging doctrine, and lessons learned from deployments and training exercises guide the P^3I efforts and recommendations.

The CGS, however, is only one part of the Joint STARS system of systems. The heart of the air segment is the modified Boeing 707 E-8 aircraft, mounting a large,

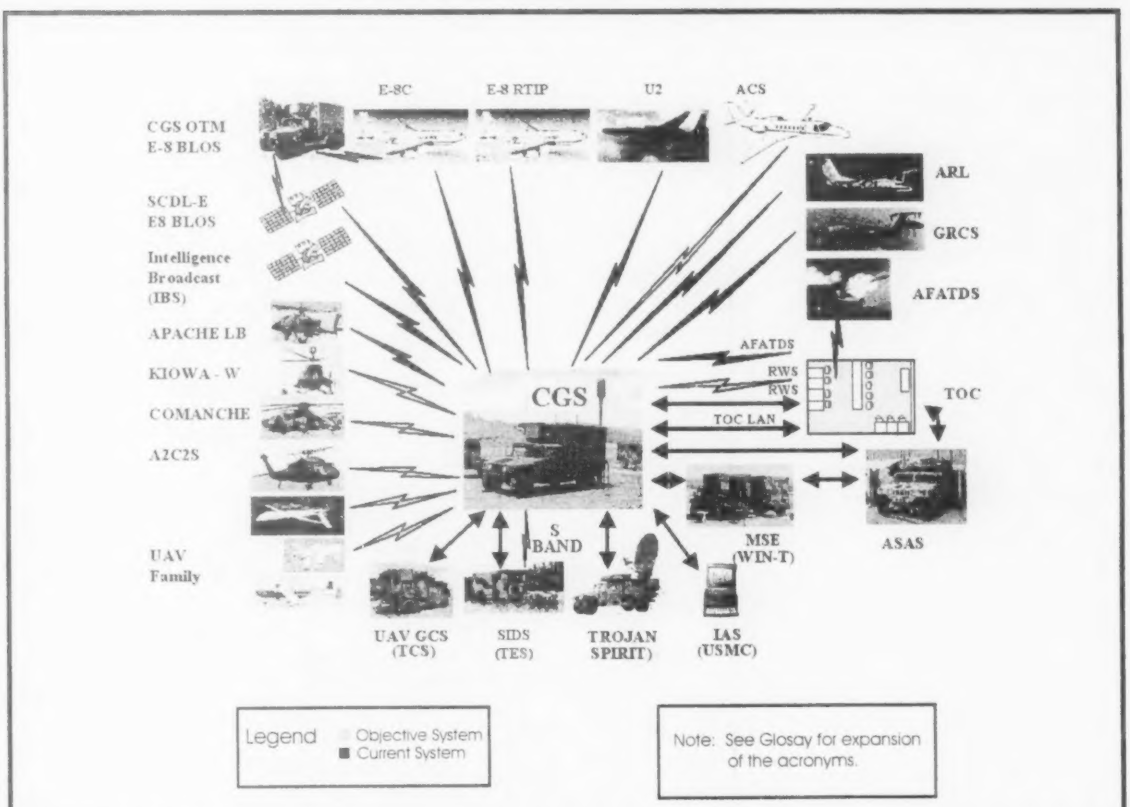

Figure 1. Current and Objective CGS.

phased-array radar. Jointly crewed by the Air Force and Army, the system's primary mission is to provide dedicated support to ground component commanders. CGS crews interact with the Army element onboard, two 96Hs and one 35C imagery intelligence officer (IMINT area of concentration), passing radar service requests (RSRs) over the dedicated, jam-resistant Surveillance and Control Data Link (SCDL) to modify radar targets and modes. While only 15 CGSs can transmit to an aircraft, an unlimited number of CGSs can receive and disseminate Joint STARS data to the tactical commanders.

Operational Deployments

Although the 93d Air Control Wing (ACW) is still in the process of fielding all 13 E-8 aircraft, the system has proven so essential to commanders that it has already deployed on numerous occasions. Joint STARS deployments date back to the well-publicized participation of the first two prototype systems in Operations DESERT SHIELD and STORM to recent deployments to Bosnia, Southwest Asia, and the Republic of Korea. The Army has fielded Medium (mounted on a five-ton vehicle) and Light (HMMWV-mounted) GSMs in Europe, Korea, and with U.S. Army Forces Command (FORSCOM) to receive Joint STARS imagery. As the fielding of CGSs progresses, all legacy GSMs will be retired.

System Training

Considering the complexity of the system and the relatively high cost of aircraft operation, support for initial entry as well as sustainment training is an important consideration. The Joint STARS CGS trainer provides the U.S. Army Intelligence Center and Fort Huachuca with the capability to replicate the functionality of the CGS and it offers a realistic training capability for initial entry operators

Acronym	Description
A^2C^2	Army Aviation Command and Control System
ABCS	Army Battlefield Control System
ACS	Aerial Common Sensor
AFATDS	Advanced Field Artillery Tactical Data System
APACHE LB	APACHE LONG BOW
ARL	Airborne Reconnaissance Low
ASAS	All-Source Analysis System
ATACMS	Army Tactical Missile System
BLOS	Beyond line-of-sight
CGS	Common Ground Station
DIVARTY	Division artillery
EMTI	Enhanced moving target indicator
GRCS	Guardrail Common Sensor
IDM	Improved data modem
IAS	Intelligence Analysis System (USMC)
IBS	Intelligence Broadcast System
IPF	Integrated Processing Faculity
KIOWA W	KIOWA Warrior
LAN	Local area network
MCS	Maneuver Control System
MLRS	Multiple Launch Rocket System
MSE	Mobile Subscriber Equipment
MTI	Moving target indicator
OBJ	Objective (system)
OTM	On-the-move
RTIP	Radar Technology Insertion Program
RWS	Remote Workstation
SAR	Synthetic aperture radar
SCDL	Surveillance and Control Data Link
SCDL-E	Surveillance Control Data Link–ECHO
SIDS	Secondary Imagery Dissemination System
SINCGARS	Single-Channel Ground and Airborne Radio System
SIPRNET	Secret Internet Protocol Router Network
SPIRIT	Special Purpose Integrated Remote Intelligence Terminal (TROJAN)
TCS	Tactical Control Station
TDDS	Tactical Related Applications (TRAP) Data Dissemination System
TES	Tactical Exploitation System
TIBS	Tactical Information Broadcast Service
TOC	Tactical Operation Center
TOPS	Tactical Onboard Processing System
TROJAN SPIRIT	TROJAN Special Purpose Integrated Remote Intelligence Terminal
UAV	Unmanned Aerial Vehical
UAV-TCS	Unmanned Aerial Vehical-Tactical Control Station
USMC	U.S. Marine Corps
WIN-T	Warfighter Information Net–Terminal

Figure 2. Glossary of CGS Related Acronyms.

(Continued on page 58)

Joint Tactical Terminal and Common Integrated Broadcast Service–Modules (JTT/CIBS-M)

by Lieutenant Colonel Stephen R. Kostek

Meeting the combat forces' need for timely, secure, tactical intelligence and targeting information, the Joint Tactical Terminal (JTT) provides a high-performance, software-programmable radio. It features modular functionality that is both backward- and forward-compatible with the migration of the Integrated Broadcast Service (IBS). The JTT Common Integrated Broadcast–Modules (JTT/CIBS-M) program provides the first truly scaleable, flexible, open-architecture-software, digital radio to provide integrated tactical and intelligence broadcasts into the next millennium. JTT provides critical data links to battle managers, intelligence centers, air defenders, fire support elements, and aviation nodes across all the services and aboard airborne, sea-going, subsurface, and ground-mobile mission platforms.

The JTT allows each combat commander in chief (CINC), Army, Air Force, Navy, Marine Corps, Special Operations Forces (SOF), and other agency users to exploit the current IBS intelligence networks:

- Tactical Reconnaissance Intelligence Exchange System (TRIXS).
- Tactical Information Broadcast Service (TIBS).
- Tactical Related Applications Program (TRAP) Data Dissemination Systems (TDDS).
- Tactical Data Information Exchange Subsystem-Broadcast (TADIXS-B).
- Secondary Imagery Dissemination System (SIDS).

The JTT also supports the evolving IBS broadcast architecture, including changes to message formats and transmission protocols and the use of different portions of the radiofrequency spectrum. The JTT/CIBS-M architecture supports multiple terminal configurations, emerging technology insertion, preplanned product improvement (P^3I), and module integration into other C^4I (command, control, communications, computers, and intelligence) terminals. The Army and the other Services are procuring the baseline JTT, which has two versions: an eight-channel receive-only version and a version that receives over eight channels and transmits on one channel.

Emerging Trends in Tactical Terminals

A decreasing defense budget, a need for reducing the length of the procurement cycle, the desire for rapid assimilation of new technology, and a requirement to conduct joint-service coordinated operations spurred the creation of the JTT. Designed to meet the combat commanders' needs, the JTT also overcomes past deficiencies. In accordance with the **IBS Implementation Plan** dated October 1995, the JTT/CIBS-M is the designated objective terminal configuration across the Department of Defense (DOD). The designated migration terminals are the Commanders Tactical Terminal (CTT) and the Multi-Mission Advanced Tactical Terminal (MATT). The remaining legacy terminals will be phased out by December 2000 (see Figure 1).

Tactical intelligence terminals have been plagued with lack of commonality in hardware and software, resulting in inefficiencies in re-use, manufacturing, logistics, scaleability, procurement, interoperability, maintenance, and training. The JTT combines the strategies of the joint services into a standards-based architecture, relying heavily on widely accepted clearly defined commercial standards. The JTT systematically addresses shortfalls by embracing an open flexible, and scaleable architecture. The open systems architecture focuses on modularity by function, not by waveform or network. Using a software download, JTT can accept changes in format and protocol as IBS networks migrate to a common format. Adoption of the JTT architecture fosters interoperability between tactical terminals, while dramatically reducing cost, development and fielding time, and ensuring a migration path into the future. This open architecture also allows a natural progression of

module improvement with advances in technology; this enables those companies with sufficient expertise to compete at the module level to enhance performance and reduce cost. By providing hardware and software in common modular form, we can design terminals around a catalog of common modules, designated the Common IBS-Modules (CIBS-M).

With an emphasis on enhanced lethality, survivability, rapid operating tempo (OPTEMPO), greater synchronization, and reduced fratricide, the tactical intelligence networks must rise to the occasion. Sensor-to-shooter links must be wide bandwidth (high-definition imagery), instant access (low latency), robust (jamming- and interference-protected), with transparent (to the user), seamless channels. Because we will conduct operations at a rapid OPTEMPO with high-dynamic mobility platforms, on-the-move (OTM) operation with dynamic message routing is required. The modern warrior must seamlessly exchange information (voice, textual data, graphics, images, and video) among all the Services, at every echelon in the chain of command, and in all formats.

The key to winning the war is information dissemination in a common tactical picture that everyone can easily understand and use. Information superiority is the glue that holds together the dominant maneuver, precision engagement, focused logistics, and the full-dimensional protection capabilities required to support joint and coalition force structures. The Integrated Broadcast Service meets this need for disseminating situational awareness (SA) to the combat forces.

As warriors proactively jam enemy lines-of-communication (LOCs), modern intelligence terminals must have sufficient freedom requiring a multimode, multi-frequency, multichannel radio terminal capable of seamless inter-networking between layers of networks. Future intelligence terminals require total programmability of frequency (multi-frequency), waveform (multimode), and number of channels (multichannel) as well as communications security and transmission security (multiple information security).

The military has examined the cost of conflict preparation. Secretary of Defense William Perry announced that the military could no longer afford defense-funded, defense-unique solutions to military requirements. Furthermore, for an increasing number of defense-critical technologies, it has been determined that commercial demand, not defense demand, drives technical progress. Commercial economies of scale and technology innovation help offset the declining military budget. DOD emphasis on affordability and interoperability drove the solution to the maximum use of commercial off-the-shelf (COTS) and non-developmental item (NDI) equipment. Government and industry have collaborated to demonstrate technology, refine concepts, mature the technology, and reduce risk.

JTT Supports Users Needs

The nature of the tactical intelligence terminal evolved with several identifiable trends. Today's emphasis is on multimission C^4I surveillance and reconnaissance to yield a C^4ISR terminal based on the demand for increased situational awareness (SA) while emphasizing the need to reduce terminal costs.

Commanders involved across the military operations continuum

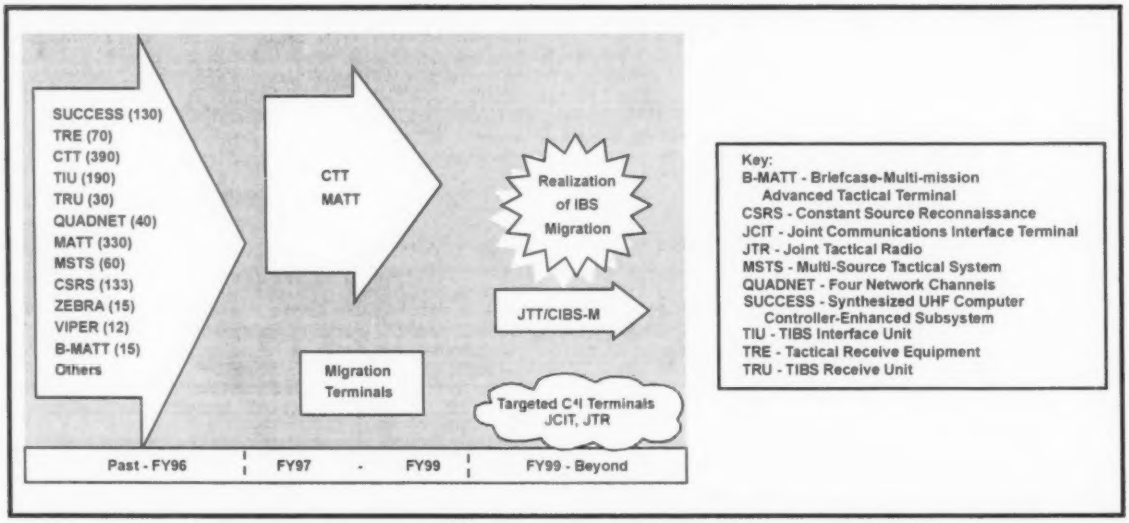

Figure 1. Integrated Broadcast Service Terminal Migration Plan.

require timely and accurate intelligence to successfully execute their missions, employing intelligence data in direct support of command and control, weapons, and sensors. Effective dissemination of this tactical intelligence relies on multiple-path, secure, worldwide data communications between producers and users at all echelons of command. The lack of interoperability between the multitude of stovepipe (non-interoperable) intelligence dissemination systems and their associated terminals has limited interactivity between producers and users. This has resulted in a less efficient SA perspective of the battlespace, hindering truly coordinated operations.

The JTT/CIBS-M program provides terminals capable of fusing diverse broadcasts in terminals with common capabilities. The modular feature of the architecture also allows producers and users to incorporate IBS capability into their C[4]I systems, using the systems' existing hardware and software by integrating only the CIBS-M modules that add the required capability. JTT/CIBS-M captures the advantages of new technologies to the greatest extent possible with the objective of using common hardware and software. Employment of JTT/CIBS-M facilitates a seamless transition from current dissemination systems to the mature IBS, while not degrading the capabilities provided by the present systems. JTT will meet the changing needs as the broadcast format changes, as the data rates increase, and as we periodically implement updates.

CINCs have a critical need for timely, secure tactical intelligence. To satisfy this requirement, the "system of systems" called IBS integrates the existing independent global and theater-level intelligence broadcasts and dissemination networks. As was mentioned earlier, the current intelligence broadcast suite includes TDDS, TIBS, TRIXS, and the On-Board Processing/Direct Down Link (OBP/DDL), previously known as TADIXS-B (see Figure 2). Additional SA is available through the 5- and 25-kHz Demand Assigned Multiple Access (DAMA) and imagery through the SIDS. JTT is a low technical and schedule risk program, because it is based the on the previously demonstrated performance of the Commanders' Tactical Terminal (CTT) with full-duplex operation (transmit and receive) on TRIXS and TIBS and receive-only on TDDS/ TADIXS-B.

The CIBS-M is a library of "plug and play" hardware modules and common, transportable software modules, used to provide JTT capabilities. DOD can package the CIBS-M as a stand-alone terminal or integrate it into other multi-Service C[4]I systems in accordance with user requirements.

Supportability Architecture

Most of the present intelligence dissemination systems are unique, non-interoperable, and require their own system-specific logistics trail. The JTT supports legacy

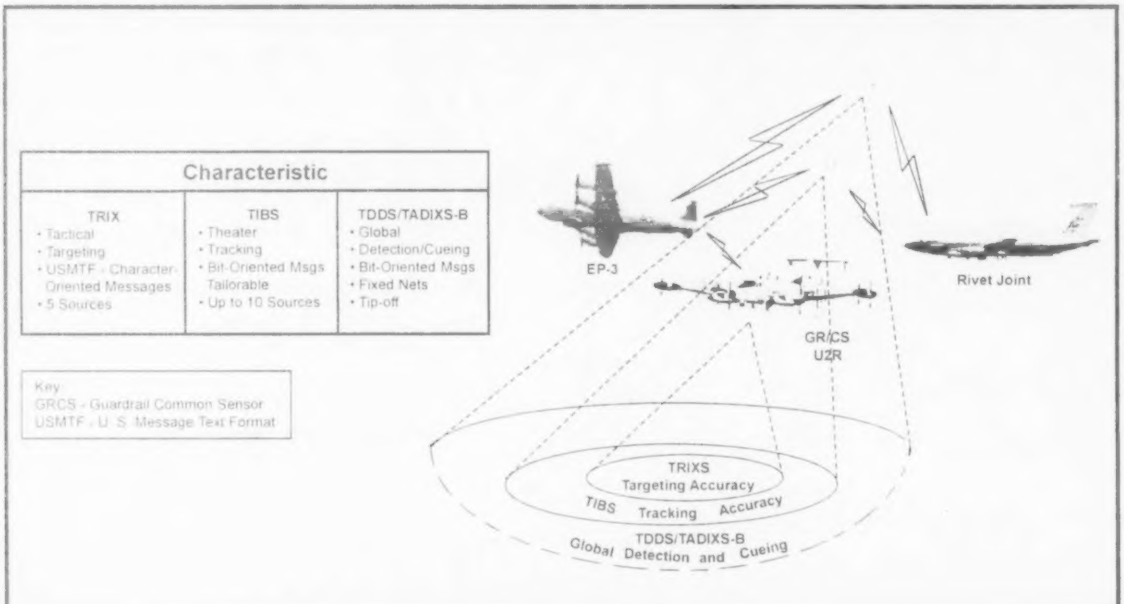

Figure 2. Present IBS Broadcasts Prograss from Targeting (TRIXS) through Theater (TIBS) to Global (TDDS/TADIXS-B) Information Accuracy and Latency.

(fielded) equipment, waveforms, and networks, while having the ability to operate in future networks. JTT's reprogrammability is flexible enough to support compatibility and connectivity to legacy networks of both the joint services and coalition forces. Through minimization of turnaround time and maximization of the mean time between operational mission failures, we achieve a JTT operational availability of better than 0.99. MTBOMF, defined as availability of half the available channels, is greater than 6,000 hours.

The built-in test capability is designed to have the ability to detect and isolate faults to a single shop-replaceable unit (SRU) to a probability of 95 percent. Shipment of the replacement line-replaceable units (LRUs) and SRUs (upon notification of failure) achieves a 72-hour turnaround time and supports both level 2 and level 3 maintenance. The MTBOMF and repair times determined the quantity of rotatable spares.

JTT meets the environmental needs of the robust platform in temperature (-32 to +43 degrees Celsius), altitude (60,000 feet), shock (catapult launch-arrested landing), vibration (MIL-STD-461), and investigations and studies of compromising emanations (TEMPEST) (NACSIM 5100). An impressive 10-year failure-free warranty will ensure that the JTT continues to meet the needs of the combat forces into the next millennium.

Conclusion

Military Intelligence must lead in force modernization. JTT will provide the flexibility and scaleability to meet the challenges of the next millenium.

Lieutenant Colonel Kostek is currently the Product Manager for the JTT/CIBS-M program. He has served in a variety of assignments at the tactical level including Company Commander, Battalion S2, and G2 Operations/Plans Officer. He has also worked at the U.S. Forces Command Office of the Deputy Chief of Staff for Intelligence and in the Office of the Chief of Staff, Headquarters, Department of Army as an Operations Research Analyst. For the last six years, LTC Kostek has been assigned to the Program Executive Officer Intelligence Electronic Warfare and Surveillance. (IEW&S) as Executive Officer to the PEO, Joint Surveillance Target Attack Radar System (Joint STARS) Common Ground Station (CGS) Test Officer, and Chief, Battlespace Integration Division. He has a Bachelor of Science degree in General Engineering from the U.S. Military Academy and a Master of Science Degree in Operations Research from the Air Force Institute of Technology. Readers can contact LTC Kostek via E-mail at and telephonically at (732) 427-5059 or DSN 987-5059.

An RC-12 aircraft. U.S. Army photo.

Aerial Common Sensor: The Eyes and Ears of the 21st Century Warfighter

by Lieutenant Colonel Thomas D. Smart (USA, Retired)

The primary business of the Army is to focus its warfighting capabilities at a given time and place to achieve a military objective. The Army's ability to do that depends largely on each ground commander's ability to "see" the battlefield. The commander must know with real-time certainty and a high degree of confidence where both friendly and enemy forces are, accurately interpret enemy intent, and operate within the enemy's decision cycle.

Gaining Information Dominance

This ability to gain information dominance—to achieve battlefield situational awareness—is a prominent and well-documented goal, clearly outlined in **Joint Vision 2010** and **Army Vision 2010**. As we build Army XXI and shape the Army After Next, we continue to invest heavily for its attainment.

The Army ground commander has a wide array of platforms and sensors on which he can draw to "see" his battlespace and to gain information dominance. These include organic assets, national assets provided through the Tactical Exploitation of National Capabilities (TENCAP) systems, and joint assets such as the E-8 Joint Surveillance Target Attack Radar System (Joint STARS), RC-135 Rivet Joint, and the U2. The most robust organic capability, however, resides in the Army's airborne surveillance and reconnaissance assets: Guardrail Common Sensor (GRCS) and Airborne Reconnaissance Low (ARL). For Army XXI and the Army After Next, the capabilities of the GRCS and ARL will combine in a single platform, the Aerial Common Sensor (ACS). ACS, like its predecessors, will be one of the most responsive and prolific contributors to tactical commanders' knowledge of their battlespaces.

The GRCS and ARL Legacy

The Guardrail system has been the Army's workhorse for airborne signals intelligence (SIGINT) collection for more than 25 years. Over this period, several versions of the Guardrail have been developed and fielded, each system providing the tactical commander an enhanced capability. Three variations of the current system, GRCS, are operational today. The Army will field the final and most capable GRCS system to III Corps' 15th MI Battalion in 1999.

The GRCS provides near-real-time SIGINT and targeting information to tactical commanders throughout the corps area. Each system consists of 6 to 12 RC-12 Guardrail aircraft, which normally fly operational missions in sets of two or three. Processing of the collected signals is performed on the ground by the Integrated Processing Facility (IPF). Interoperable datalinks provide the connectivity between the airborne systems and the IPF. The Commanders Tactical Terminal (CTT) or Joint Tactical Terminal (JTT) accomplishes near-real-time reporting.

The ARL grew from a Commander in Chief U.S. Southern Command (SOUTHCOM) urgent requirement for a low-cost, low profile airborne system to aid in the detection and monitoring of illegal drug traffic. Initially fielded in communications intelligence (COMINT) and imagery intelligence (IMINT) (ARL-C and ARL-I, respectively) variations, the multifunction ARL-M combines these capabilities. It provides the commander with varied imagery capabilities:

- Forward-looking infrared (FLIR).
- Infrared line scanner (ILS).
- Electro-optical (EO).
- Moving target indicator (MTI).
- Synthetic aperture radar (SAR).

Although all ARL-Ms are configured for a COMINT capability as well, only two ARL-Ms will be equipped with the Superhawk COMINT subsystem. Although there are requirements for nine ARL aircraft, funding is available for only eight.

The Army's airborne reconnaissance systems provide the ground commanders with an unmatched ability to conduct surveillance and reconnaissance in their areas of operation and across the entire electromagnetic spectrum. The V Corps' 1st MI Battalion flies daily GRCS missions in support of Operation JOINT FORGE. Since deploying in December 1995 (and as of September 1998), they completed more than 2,400 sorties, achieved 14,000 accident-free flying hours, and generated more than 5,000 intelligence reports. The U.S. Army Intelligence and Security Command's (INSCOM) 3d MI Battalion in Korea flies nightly indications and warning missions

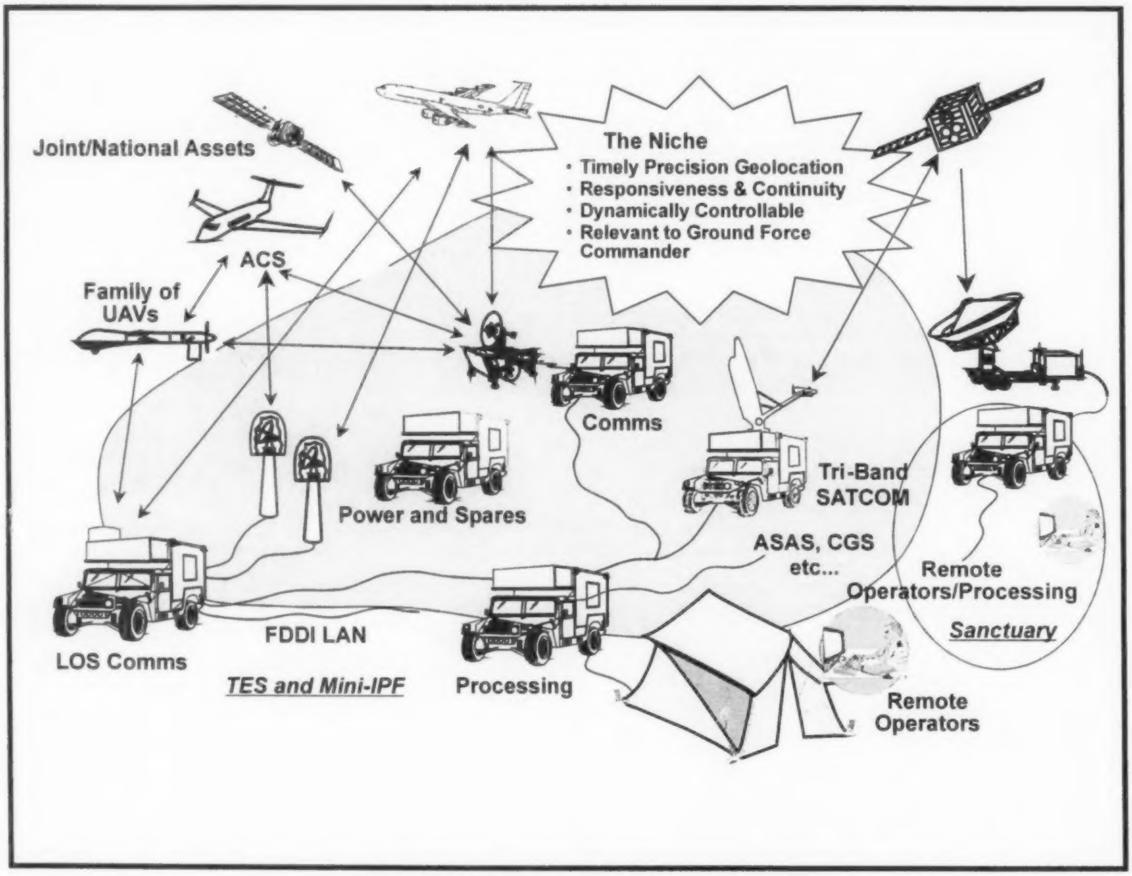

Figure 1. ACS Concept of Employment.

an average of 27 days per month using the ARL-M's MTI and SAR sensors. The ARL-I and ARL-C platforms assigned to INSCOM's 204th MI Battalion continue to operate throughout SOUTHCOM in support of the counterdrug mission.

Why ACS?

Why should the Army invest scarce resources in an enhanced aerial surveillance and reconnaissance capability, currently planned for fielding in 2009? Why not rely on enhancements to current Army systems and the systems of the other Services, such as Joint STARS, EP-3E Aries II, Rivet Joint, the Predator medium-altitude endurance (MAE) unmanned aerial vehicle, national systems, and future high-altitude UAVs such as Global Hawk?

To be sure, each has its place on the battlefield, and each fits into the overall reconnaissance, intelligence, surveillance, and target acquisition (RISTA) scheme. The final answer, however, lies primarily with the fact that we will design and build ACS, like its predecessor systems, to support the tactical commander on the ground. ACS will be an all-weather responsive intelligence, surveillance, and reconnaissance (ISR) capability dedicated to supporting Army tactical requirements. ACS will provide unique precision locations to support the deep targeting of Army weapons systems. The system will be capable of sustaining a continuity of coverage during periods of high operating tempo, maintaining a high level of reliability at an affordable cost, while supporting the production of predictive, timely intelligence.

The Aerial Common Sensor represents a logical migration path from the legacy systems. Combining the capabilities of GRCS and ARL into a single platform will give ground commanders an unprecedented ability to know and understand their battlespaces. The ACS design will include the internal ability to cross-cue sensors and conduct multisensor correlation, thereby providing immediate confirming information.

Like its predecessors, ACS will be a standoff system. This characteristic not only enhances the survivability of the aircraft and its crew, but also permits the aircraft to fly at the appropriate altitudes to optimize sensor performance and cover the extended area required by a corps. The ACS design will permit it to operate as a system with tactical UAVs, giving the commander flexibility for situations where an overflight sensor is required or when the threat situation dictates an unmanned platform.

Today, the GRCS is the only DOD aerial platform able to provide precision geolocation of targets using time differential of arrival and differential Doppler, giving an unequaled targeting capability for precision-guided munitions. ACS will expand this capability through improved collection and processing with organic SIGINT sensors and by dynamically interacting with national systems. The result will reduce targeting circular error proba-

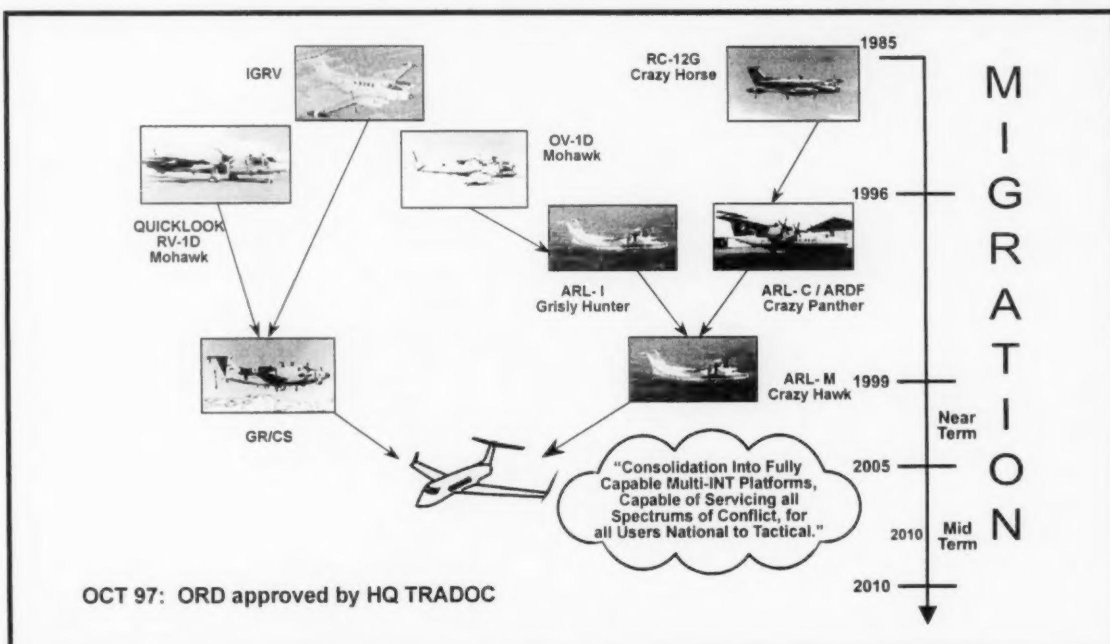

Figure 2. ACS, the Army Airborne RISTA Evolution.

bility, increase the number of targets identifiable at a given time, and enhance the ability to locate and track short duration and moving emitters. The latter functionality is not available with single platform, long baseline systems.

Army airborne surveillance and reconnaissance assets are an active component of the tactical commander's battlefield. They are an integral part of operational, targeting, and movement planning and are capable of supporting scenarios across the full range of military operations. These aerial assets are significant and direct contributors to Force XXI corps operations and relate directly to the imperatives in **Army 2010**. Specifically, they enable commanders to operate throughout the depth, width, and height of their areas of operations. These airborne collectors:

- Support and enhance the corps' joint, multinational, and interagency operations and connectivity.
- Permit split-based operations.
- Materially enhance information operations to gain superior situational awareness.
- Provide the intelligence and information to permit the corps commander to exercise dominant maneuver, mass effects, and accept well-informed risk.
- Directly support precision engagement through the provision of targetable data.
- Efficiently disseminate information and intelligence products to the lowest level user.
- Give the commander the means to operate within the adversaries' decision cycle by providing real-time information.

System Overview

ACS will consist of three major component groups. They are the Ground Processing Facility (GPF), the Airborne Platform Subsystem (APS), and a modular, reconfigurable suite of sensors, processors, and reporting equipment known as the Airborne Mission Equipment Subsystem (AMES).

GPF. The GPF will evolve from the mini-IPF, an enhancement currently under development for GRCS. The deployment of the mini-IPF will address the significant shortfall in the ability of GRCS to deploy rapidly. The GPF will be a tailorable, scaleable, modular, and C-130 Hercules transportable, intelligence processing system. The function of the GPF will be to control Army and the other Services' airborne sensors and direction-finding systems. It will receive, process, display, and generate SIGINT- and IMINT-derived intelligence reports and rapidly disseminate these reports to ground commanders at all levels.

The GPF will be compliant with both Joint Airborne SIGINT Architecture (JASA) and Joint Interoperable Network (JOIN). It will interoperate with the TENCAP Tactical Exploitation System (TES).

With a modular configuration and small footprint, both the near-term mini-IPF and the objective GPF will give the tactical commander a responsive, deployable, expandable analysis and dissemination capability. Satellite communications (SATCOM) links will permit analysis in sanctuary for early entry operations and will enhance the dissemination of refined products.

APS. The ACS Airborne Platform Subsystem will be a non-developmental aircraft. The essential operational parameters for the airframe include:

- The capability to self-deploy globally.
- An extended operational range.
- The ability to conduct operations immediately after arrival in theater.
- Operational altitudes that permit optimization of payload employment.
- The capability to carry a full suite of sensors.
- Both terrestrial and SATCOM datalinks.

The aircraft will also be equipped with workstations for conducting initial onboard analysis. The ACS will have a common datalink (CDL) capability for communicating air-to-air and air-to-ground for ACS-UAV operations, as well as connectivity to tactical operations centers and sanctuary processing centers (Regional Security Operation Centers).

AMES. The primary mission of the ACS Airborne Mission Equipment Subsystem will continue to be to locate, identify, and produce targetable precision geolocation information on high-payoff threat signals and to provide that information to the tactical commander in near-real-time. The AMES suite will include DOD-compliant SIGINT, IMINT, and measurement and signature intelligence (MASINT) sensors. They will be able to operate against the most sophisticated threat technologies of the future. Many of these technologies will be openly available in the commercial market, resulting in a proliferation of inexpensive, difficult-to-defeat communications and electronic systems in the hands of potential adversaries.

The ACS will support the corps commander, but will have the capability to support ground commanders at all levels. Based on the corps commander's priorities, it could provide a "pull" system to respond to queries of specific interest to lower echelon commanders. Needed information, such as images of a specific road junction, could come from established databases or directly from mission aircraft. Much of the collateral locational information that is currently not used is valuable to the shooter and could be provided to them directly via the Intelligence Broadcast Service (IBS) and Global Broadcast System (GBS). There is no reason why an Army Tactical Missile System (ATACMS), an attack air-

aircraft, or a light-force battalion commander engaged in a peace-keeping operation could not receive real-time data within a set of parameters defined by the commander or crew.

Bottom Line

"Where am I?" "Where are my friends?" "Where is the enemy and what is he doing or going to do?" The commanders who can answer these questions clearly will have a tremendous advantage. They will be able to concentrate forces at locations and times of their choosing while accepting informed risk elsewhere. Ultimately, they will be able to focus combat power to destroy the enemy and protect their own.

The Army's ACS, like its legacy systems GRCS and ARL, will make a vital contribution to the commander's comprehensive awareness of the battlespace. It will give the ground commander an organic, responsive capability that (in conjunction with the assets of the other Services and national means) clears away much of the "fog of war." ACS and its predecessors are integral and vital to achieving information dominance today and in the foreseeable future. ACS will be the eyes and ears of the 21st century commander.

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Select a relevant topic of interest to the military intelligence community. For example, it could be about current operations and exercises, equipment, TTP, or training. It could be historical, explain lessons learned, or it could be an essay-type thought-provoking piece. It could be a short "quick tip" on better use of equipment or personnel, or fast "work-arounds" for problems. Articles from the "hot spots" are always welcome.

Write an outline to organize your work and include a working title and headings. Plan to write 1000-2500 words (about 2-4 pages single-spaced text with normal margins, not counting graphics) and include graphics that enhance understanding of your topic. Quick tips should be 300-800 words. Put the "bottom line up front" and write clear, concise introduction and conclusion paragraphs. Follow proper rules of grammar. Consult **DA Pamphlet 600-67, Effective Writing for Army Leaders**, or William A. McIntosh's **Guide to Effective Writing**. Maintain the active voice as much as possible. Write, "Congress cut the budget" rather than "The budget was cut by Congress."

Please send the article via E-mail (to vesselse@huachuca-emh1.army.mil with courtesy copy to mcgoverne@huachuca-emh1.army.mil or mail it (with a soft copy on disk) to Commander, U.S. Army Intelligence Center and Fort Huachuca, ATTN: ATZS-CLM (MIPB), [FedEx/Priority Mail: Bldg 61730, Room 127], Fort Huachuca, AZ 85613-6000. (Please do not use special document templates and attach the graphics separately. We can accept articles in Microsoft Office 97, Word 6.0, Word Perfect 6.0a, and ASCII and PowerPoint or Corel graphics.) Please include with your article:

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A Family of UAVs—Providing Integrated, Responsive Support to the Commander at Every Echelon

by Colonel William M. Knarr, Jr.

Since 1988, we have envisioned an unmanned aerial vehicle architecture with UAV systems supporting commanders at brigade, division, and corps while also providing access to non-Army theater- and national-level UAVs. During the past several years, the advent of "miniaturizing" technologies in the aerospace industry has extended that vision to include micro- and mini-UAV support to squad-, platoon-, company-, and battalion-level commands as well as special operations forces. Additionally, the "smorgasbord" of available payloads and the emergence of teaming concepts to link the UAV and manned Special Electronic Mission Aircraft (SEMA) or attack (Comanche and Army Tactical Missile System) assets have highlighted the versatility and value of the UAV. The vision: A family of UAVs providing integrated, responsive support to the Commander at every echelon.

Lessons learned during Operation DESERT STORM and in Bosnia, reinforced with the successful Advanced Warfighting Experiments (AWEs) at the National Training Center (NTC) and Fort Hood, Texas, show us that the commander with the most accurate "vision" of the battlefield will win the battle. This is battlefield visualization. Army UAVs are an essential component in providing the commander with accurate, continuous, and timely battlefield visualization. Another lesson learned—there is no silver bullet! The UAV, as a commander's tool, is a confirming sensor and relies on sound intelligence preparation of the battlefield and cueing by other sensors or systems. As such, it needs to be consistent, dependable, and linked in time and space to the commander's plan and operation. If it is not, it becomes a "free lancer" on the battlefield—it loses its synergistic effect, and it may diffuse the commander's efforts by diverting focus and fires to less important areas.

This article addresses the Army's UAV requirements and concept of operations. It also briefly looks at each of the UAV systems or programs that indirectly or directly support these Army requirements.

"A Family of UAVs"

UAVs have application across the battlefield. Figure 1 reflects UAVs and support systems in various stages of development that are available, in total or part, to the Army. As we work to field UAVs to the force, however, we may not be able to afford separate systems at all tactical echelons. We also need to leverage other Service systems, such as the U.S. Air Force (USAF) endurance systems, to provide as much support as possible to ground force commanders.

Our focus during the past few years has been on the brigade, division, and corps. However, as we walk the battlefield from the micro- to the high-altitude endurance (HAE) UAVs, the reader will see a more complete picture of these systems, which includes their stages of development and their applicability at the various levels. I will also discuss the Tactical Control System (TCS), designed to supplement our Ground Control Stations (GCSs) and allow us access to other Service UAVs and simulation support. Finally, I will discuss the development of an Integrated Concept Team (ICT) to coordinate the multitude of UAV initiatives.

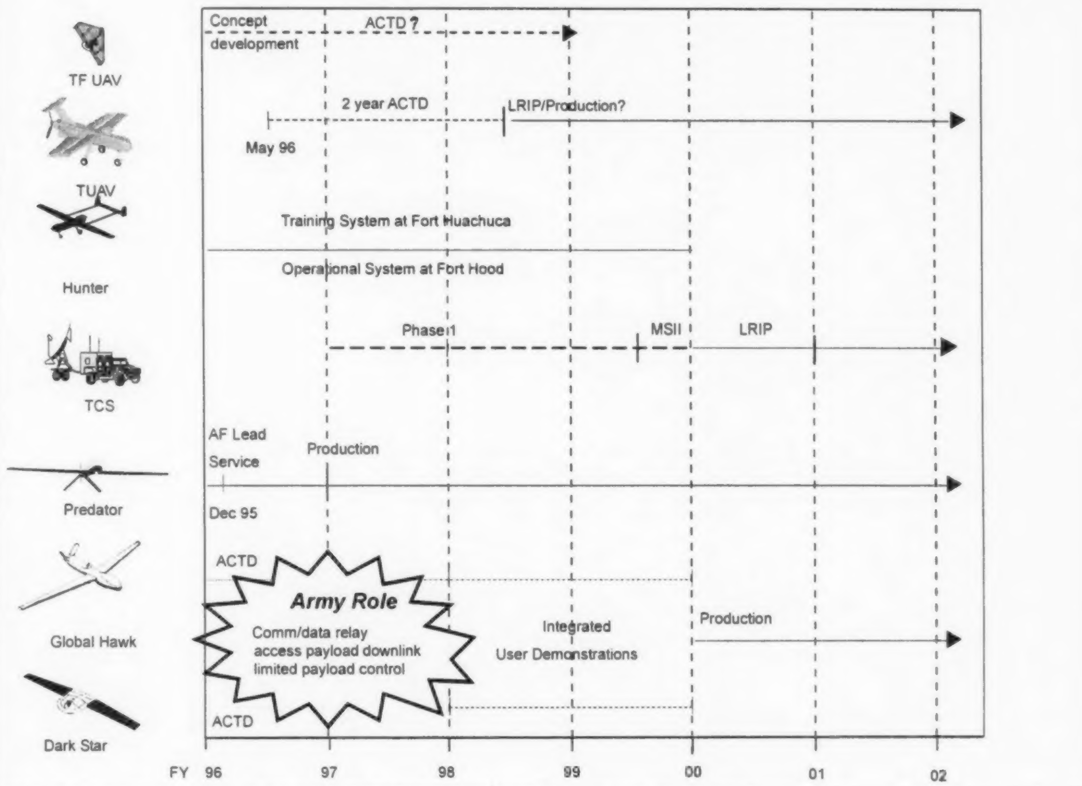
Task Force UAVs

Task Force (TF) UAVs consist of micro air vehicles (MAVs) and small or mini-UAVs; essentially, they will support mounted and dis-

mounted forces, scouts, and special operations forces at battalion and below. TF UAV missions include urban and special target reconnaissance, hostage rescue, and counterdrug operations; trails, routes, and ambush-site surveillance; or simply over the next hill reconnaissance.

MAVs, such as the one pictured, are currently under development by the Defense Advanced Research Project Agency. DARPA has been working with the Services and industry to develop an air vehicle no larger than 15 centimeters in length, width, and height, capable of performing a useful military mission at an affordable cost. The draft Mission Needs Statement (MNS), currently out for review, calls for a system capable of 10-kilometer (km) range, endurance up to one hour, and operations in urban environments. This system is most appropriate for small unit and special operations use. The U.S. Army Electronic Proving Ground (EPG) at Fort Huachuca, Arizona, is currently working with DARPA to develop a MAV range and facilities on Fort Huachuca to support MAV demonstrations and testing and to host airframe competitions.

Small or mini-UAVs have the capability of ranging 20 to 25 km for one to two hours, have a wing span of four feet or less, and weigh no more than 25 pounds. These UAVs



Key:

ACTD	Advanced Concept Technology Demonstrations	Km	Kilometers
AF	Air Force	m	meters
EO	electro-optical	MS II	milestone II
FLOT	forward line of own trops	RISTA	reconnaissance, intelligence, surveillance, and target acquisitionTactical Control Station
FY	fiscal year	SAR	synthetic aperture radar
IR	infrared	TCS	task force
JCS	Joint Chiefs of Staff	TF	Tactical UAV
JTF	Joint Task Force	TUAV	year
LRIP	low-rate initial production	yr	

Figure 1. Family of UAV Systems.

can be soldier-packed or vehicle-mounted and launched. Systems exist today with those capabilities; examples include the Mini Backpack by Mission Technologies, Inc. of San Antonio, Texas, and the Sender UAV, built by the Naval Research Laboratory. The small or mini-UAV requirement is still on the drawing board.

Tactical UAVs (TUAV)

Since 1988, the Army has documented its tactical UAV requirements with the Close Range (CR) TUAV supporting the brigade commander and the Short Range (SR) TUAV supporting the division (heavy) and corps commanders. The endurance systems will support echelons above corps (see Figure 2). Let me first address the tactical systems—CR and SR systems.

The design of the brigade commander's CR UAV will be relatively simple, light, inexpensive, easily maintained and trainable, with a threshold range of 50 km. This UAV—

- Provides a basic day-night electro-optic and infrared (EO/IR) capability—the brigade commander's system, his "dominant eye."
- Will launch and recover from an area easily accessible to the brigade.
- Ties into the basic command, control, communications, computers, and intelligence (C^4I) network including the All-Source Analysis System (ASAS), Advanced Field Artillery Tactical Data System (AFATDS), Common Ground Station (CGS), and

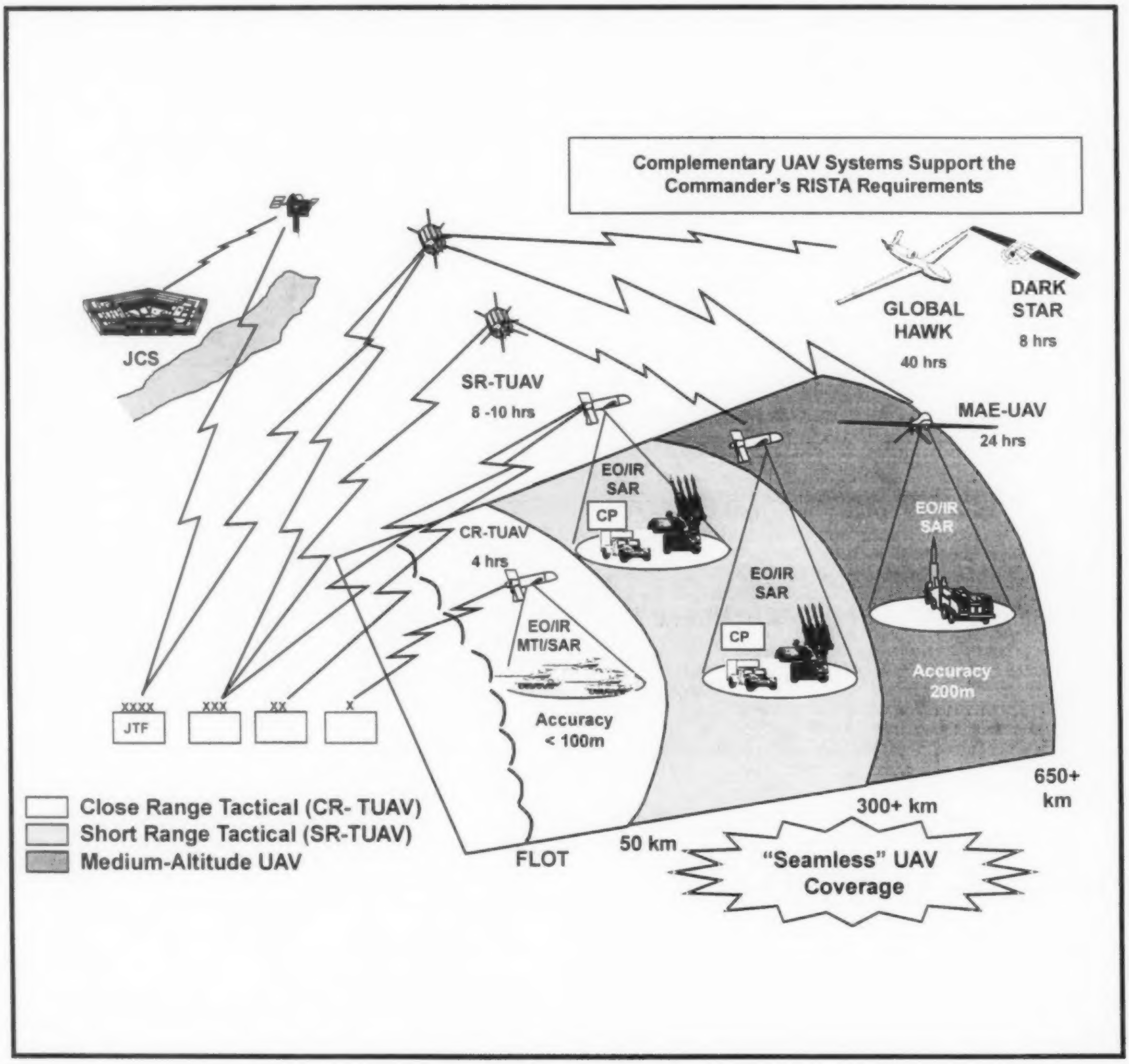


Figure 2. UAV Concept.

Army Airspace Command and Control (A^2C^2) system.

Assigned to the military intelligence battalion in the division, the CR-TUAV will provide direct support (DS), through the MI DS companies, to the brigades.

In pursuit of those requirements, the joint community completed a 26-month Joint Advanced Concept Technology Demonstration (ACTD) on a UAV system called Outrider. The intention of the Outrider program design is to meet U.S. Navy-Marines and Army CR requirements; each Service has its own set of requirements, and Outrider's challenge was to try to satisfy everyone's needs.

Each Outrider system consists of four air vehicles (AVs), EO/IR payloads for each AV, and two GCSs with ground data terminals transported in two high-mobility multi- purpose wheeled vehicles (HMMWVs) with shelters and two trailers. Currently, 12 operators and 2 maintainers comprise the crew; however, we are relooking maintenance support and transportability requirements for the crews and equipment. Major program successes include automatic landing (autoland) capabilities and improved soldier-system interfaces. Still, due to program slippage, there was not enough time to integrate the system into military operations to check system rigor, operations tempo (OPTEMPO), supportability, and night fight capabilities. At the conclusion of the ACTD, TRADOC chartered the TSM office to update the CR Operational Requirements Document (ORD) incorporating ACTD lessons learned. In January 1999, the Joint Staff distributed the ORD for worldwide staffing. By March of this year, we expect a Joint Requirements Oversight Council (JROC) recommendation and, subsequently, an Office of the Secretary of Defense (OSD) decision on whether we will continue the Outrider Program or compete the requirement in a flyoff.

The design of the SR UAV, the other TUAV, was to support the requirements of the division and corps. The 3 November 1992 Joint Operational Requirements Document (JORD) for the SR UAV called for a system with:

- Range of 200 to 300 km.
- Endurance of 8 hours.
- Altitudes of 15,000 feet.
- Cruise speed of 90 knots.
- Land launch and recovery from unimproved surfaces.

The Army selected the Hunter system, but system problems led to program termination in 1996

Currently, the Army operates one Hunter system for training at Fort Huachuca, specifically with Echo Company, 305th MI Battalion. A second system with the 15th MI Battalion at Fort Hood will refine concepts and support contingency operations; a partial system with the UAV Program Manager aids in testing and evaluation. We expect to field another baseline to support training at JRTC by the summer of 1999.

Termination of the Hunter program left us with a "seam" (see Figure 3) in tactical UAV support. We still have a requirement to provide support to division and corps out to a range of 300+ kilometers but no system designated to support the mission. The proposed solution was to have Predator cover the seam; but the question was, *"How?"*

One solution was to work with the Air Force to develop a concept of operations for Predator support to divisions and corps. During operations in Bosnia and Ulchi Focus Lens (UFL) 1997 in Korea, the Army and Air Force worked tasking and dynamic retasking procedures for responsive Predator support to echelons corps and below. Although there were some successes in Bosnia, UFL indicated there were too few Predator systems to support the theater commander and component commanders, let alone provide support to corps and division levels. Additionally, success was heavily dependent upon dedicated communications and a more responsive architecture to support dynamic retasking of those systems.

Tactical Control System

As the Army worked with the Air Force to develop a concept of operations that provides responsive and quality support to division and corps commanders, all recognized that part of the solution to accessing other Service systems was the TCS. The TCS provides an interface to all UAVs, including the Predator and high-altitude endurance UAVs. However, the type of interface varies at different echelons. The system incorporates five levels of control spanning from:

- Minimum of secondary imagery dissemination.
- Direct sensor feed,
- Full payload control.
- Air vehicle control.
- Total system control including launch and recovery capabilities.

For example, the CR tactical UAV at the brigade will incorporate level five, or total system control. For the Predator MAE system, TCS could offer the division and corps commanders the capability to control the air vehicle and sensor for missions such as targeting, that require quick response times. For Global Hawk, we would expect the ground component commander to have access to at least level-three connectivity, that is, manipulation of the payload sensor.

Endurance UAVs

Within the family of UAVs, Endurance UAVs will support combat commanders in chief (CINCs) with a high-altitude, long duration, and survivable reconnaissance, intelligence, surveillance, and target acquisition (RISTA) and C^4I connectivity capability. Currently, there are three endurance UAV systems: the MAE Predator, the conventional HAE Global Hawk, and the

Low-Observable HAE Dark Star. The Predator is operational with the 11th and 15th Reconnaissance Squadrons (USAF) and the Global Hawk and Dark Star are in the midst of a DARPA-U.S. Army Atlantic Command-sponsored ACTD.

The stealthy Dark Star is designed to penetrate heavily defended airspace primarily for pre- and post-strike reconnaissance, battle damage assessment (BDA), and enemy indications and warning (I&W) missions. Army tactical commanders, however, will likely receive more support from the Predator and Global Hawk. The Predator will provide more than 24-hour coverage out to ranges of 500 nautical miles (nm) at medium altitudes (15,000 to 25,000 feet above ground level). The Global Hawk has a mission endurance in excess of 40 hours with an operational range of more than 3,000 nm at high-altitude (50,000 to 65,000 feet mean sea level).

Operationally, the Predator will perform surveillance on named areas of interest (NAIs), route reconnaissance, observation of fixed-point targets, and confirmation of high-value targets (HVT). It detects with wide-area sensors using EO/IR and moving target indicator/synthetic aperture radar (MTI/SAR) payloads. On the other hand, Global Hawk is a wide-area, standoff system. It will perform broad area surveillance with EO/IR, MTI/SAR, and ultimately, signals intelligence (SIGINT) sensors. When dedicated to the Army, Dark Star, Predator, or Global Hawk missions' positive payload control and processing will be done in the:

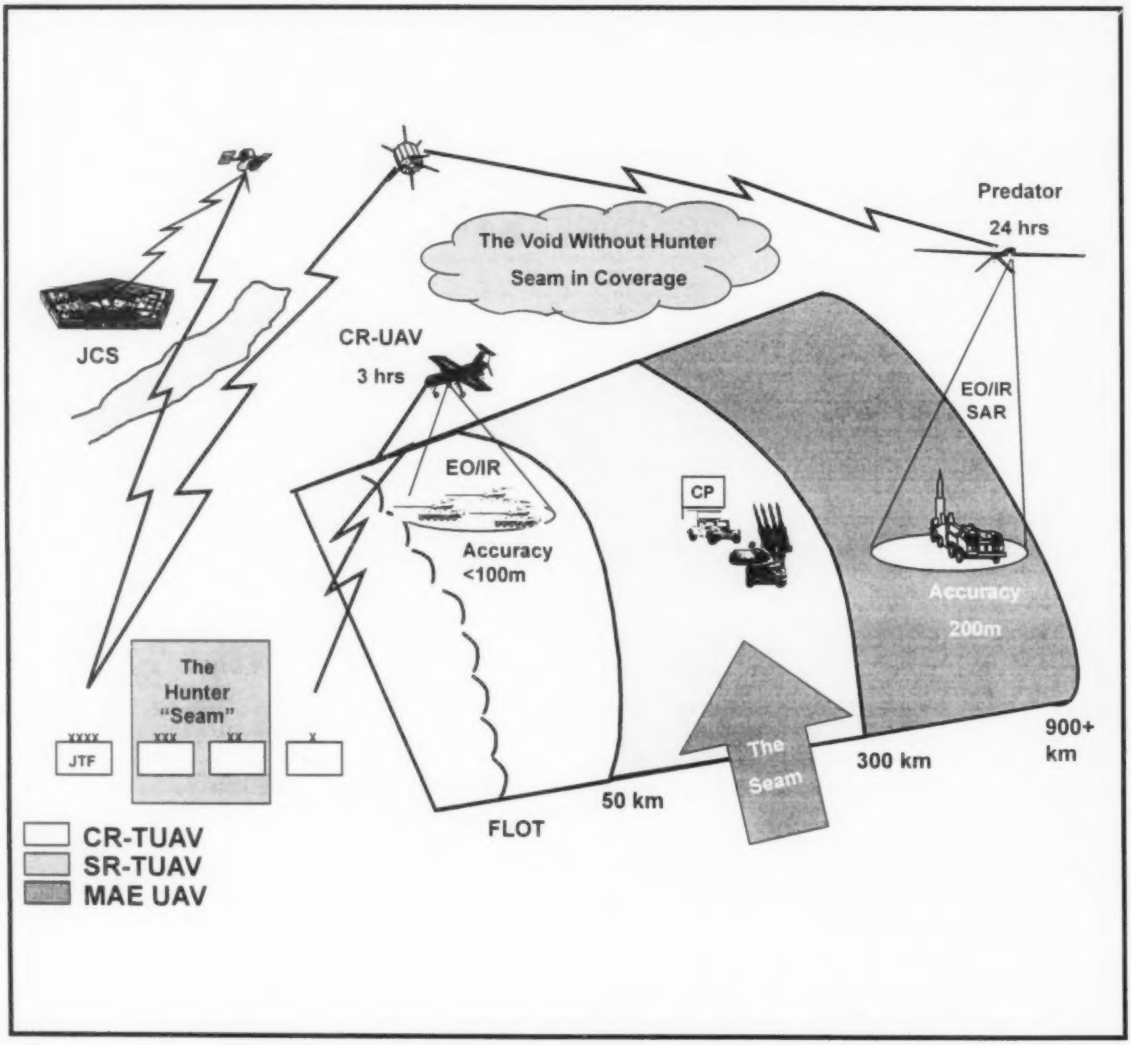
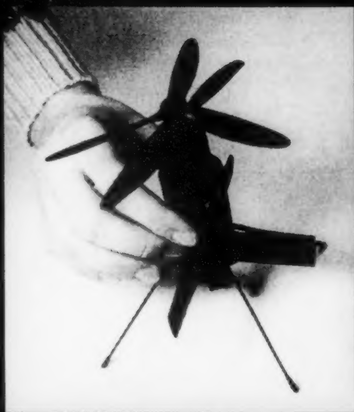


Figure 3. UAV Concept Without the Short-Range (Hunter) System.

1



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Photos Courtesy of (1) Micro Air Vehicle (MAV), Ron Barrett, Adaptive Aerostructures Laboratory, Aerospace Enginering Department, Auburn University; (2, 3) Outrider CR Tactical UAV and Hunter SR Tactical UAV, Program Manager, JTUAV Project Office; (4) Preditor MAE UAV, USACOM; (5, 6) Global Hawk HAE UAV and Dark Star UAV, DARPA, HAE Program Office.

- Enhanced Tactical Radar Correlator (ETRAC) or Tactical Exploitation System (TES) (imagery).
- Guardrail Common Sensor (GRCS) Integrated Processing Facility (IPF) (SIGINT).
- Aerial Common Sensor (ACS) Ground Processing Facility (GPF) (SIGINT).

Additionally, there will be Global Hawks configured for high-capacity communications and data-relay missions orbiting above friendly forces. This payload is the Airborne Communications Node (ACN) and will be an essential component of the Army's Warfighter Information Network.

UAVs in Exercise Simulations

The Multiple Unified Simulation Environment (MUSE) is a command and staff trainer designed to train the force on UAVs before system fielding. The MUSE provides tactical messaging, near-real-time video and freeze-frame imagery products to the supported unit, allowing staffs to plan and execute UAV missions, as they will do with actual UAV systems. Units training at the National Training Center beginning in fiscal year 2000 (FY00) will use the MUSE, a component of the Combat Synthetic Training Assessment Range (CSTAR). CSTAR will further expose units to UAV realism in more tactical environments than in many past simulations and will complement tactical UAV system fielding.

UAV Integrated Concept Team

On 6 October 1998, TRADOC approved the Intelligence Center's proposal to establish a formal Integrated Concept Team (ICT). The purpose of the ICT is to serve as a forum to address and coordinate UAV issues throughout the Army as well as with the other Services. Additionally, the ICT will develop a forward-focused unified plan to ensure a smooth integration of all UAV systems and support into the Army of the future.

Summary

In summary, the Army plans to capitalize on UAV support to the ground force commander at every echelon. Let me leave with you a couple of thoughts.

Our first priority is to field a UAV to support the brigade commander.

Second to fielding a brigade system is resolving the Army's short-range UAV requirement. Upon termination of the Hunter system, the proposed solution was USAF Predator support to the division and corps commander. However, observations and lessons learned indicate there are not enough systems programmed in the inventory to support the division and corps, and the Predator tasking and reporting process is not sufficiently responsive to meet their needs.

Finally, the number of UAV initiatives reflects the intense community interest in a variety of platform and payload programs, not only within the Army, but across DOD and internationally. Affordability will curb that appetite. Additionally, the ICT will serve as a forum to coordinate efforts and leverage other Service systems. UAVs are an exciting business that touches all centers and Services!

Endnote

1. Funding for CSTAR is through the Army's Warfighter Rapid Acquisition Program (WRAP) based on its performance during the TASK Force XXI Advanced Warfighting Experience. CSTAR uses the models provided by FIRESTORM (the Federation of Intelligence, Reconnaissance, Surveillance and Targeting, Operations and Research Models); the July-September 1997 issue of ***Military Intelligence*** discussed the CSTAR in detail.

Colonel Bill Knarr is currently the TRADOC System Manager (TSM) for Unmanned Aerial Vehicles (UAV) and Aerial Common Sensor (ACS). He has held various intelligence and aviation positions throughout his career and was previously the Commander, Joint Intelligence Center, U.S. Special Operations Command. Readers can contact him at (520) 533-2165, DSN 821-2165, and by E-mail at knarrw@huachuca-emh1.army.mil.

Looking For The Best

The United States Army Special Operations Command (USASOC) and its units are looking for highly motivated, physically fit, airborne qualified (or willing to go to airborne school), language speaking (DLPT 2/2) military intelligence soldiers. USASOC's units include the 75th Rangers, 160th Special Operations Aviation, special forces, psychological operations (PSYOPS), civil affairs, and the U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS).

USASOC is looking for soldiers in the following military occupational specialties 96B (Intelligence Analyst), 96D (Imagery Analyst), 97B (Counterintelligence Agent), 97E (Interrogator), 98C (SIGINT Analyst), 98G (Voice Interceptor), and 98H (Communications Locator/Interceptor). USASOC is not limited to just Fort Bragg locations but also includes Forts Campbell, Lewis, Carson, Benning, Stewart/Hunter Army Airfield, as well as Germany, Okinawa, and Panama.

Interested personnel can contact SGM Fowler, USASOC Deputy Chief of Staff for Intelligence, E-mail fowlers@soc.mil, (910) 396-6270/8389, DSN 239-6270/8389; or SFC Dodd, USASOC Deputy Chief of Staff for Personnel, E-mail doddj@soc.mil. Come join the small number of MI professionals in the special operations community that are truly—the quiet professionals.

Entity-Based Simulations—

Exploiting Their Benefits to Train Battle Command

by Major Stephen K. Iwicki

The U.S. Army must train to meet a gamut of potential missions ranging from major regional conflicts to security operations and stability operations. Our soldiers will also face a variety of threats from conventional battle to actions against criminal and terrorist organizations. In today's fiscal environment, however, it is not possible to conduct enough live training exercises to meet all these needs. The Army is relying more on simulations to fill this training void. Today's current suite of simulations falls short in providing the simulation environment necessary to properly train an information-dominant battle command process. We need reality simulated to the degree we will find on the Force XXI battlefield and displayed by the intelligence and information systems we will use.

Analysts of the future must manage and employ evolving suites of intelligence systems. Many of these systems receive intelligence data from a variety of sources not organic to the unit's table of organization and equipment (TOE). As technology advances, fewer intelligence systems process increasing amounts of intelligence data. This magnifies our training challenges by forcing more operational requirements on our soldiers, while decreasing their ability to train with these systems. Units cannot afford to fund live Joint Surveillance Target Attack Radar System (Joint STARS) flights ($25,000 per flight hour) to maintain Common Ground Station (CGS) operator proficiency. Even if the funding were available, most theater and national intelligence assets are employed in real-world collection missions and are not available to support Army training.

Our doctrine calls on commanders to gain information dominance and to precisely shape their battlespace for decisive operations. They cannot do this without hands-on control of their supporting intelligence processes and a training venue allowing the development of integrated, crossfunctional area technical skills. Moreover, they cannot do this with the current suite of aggregate-level simulations. Fortunately, developmental programs will meet those needs shortly.

Aggregate or Entity Simulations?

Aggregate simulations represent a unit and all its personnel, equipment, and behaviors with one simulation icon. We typically represent entire battalions with one simulation icon. With entity simulations, we represent each major platform (truck, tank, or helicopter) with its own icon. The advantage with entity representation is that you can detect, target, and destroy a single object (e.g. tank) and portray the loss of that object to its parent unit. This approach creates the high-fidelity training environment we need to support Force XXI training.

The Problems with Current Systems

For years, senior Army leaders have repeatedly commented that "Blue" forces always win in Battle Command Training Program (BCTP) exercises where there is a notional enemy and lose to the live opposing forces at the Combat Training Centers (CTCs). One dramatic difference between these two training environments is in the representation of intelligence operations. The challenge is to develop a realistic, well-balanced portrayal of intelligence capabilities in both training environments.

Today, short of live exercises, we train primarily with a constructive simulation called the Corps Battle Simulation (CBS). This aggregate-level simulation drives a variety of our command post exercises, including the BCTP Warfighter Exercises. The BCTP Intelligence Collection Model or a combination of the BICM and the Tactical Simulation (TACSIM) portrays intelligence. BICM provides an unrealistic, more accurate portrayal of the battlefield situation than we can create with our real-world capabilities. TACSIM produces realistic products but only models Blue intelligence, surveillance, and reconnaissance (ISR) systems. Additionally, TACSIM is extremely resource-intensive to operate.

When we train with the CBS, we typically fight icons arrayed in echelons, each representing the combat power of 10, 30, or 90 tanks, tracked vehicles, or other high-end pieces of combat equipment. These icons comprise our target base and we feed their locations into the linear, almost assembly-line processes devised for annihilation warfare. We attack these targets, and typically view quality training as providing more targets than a linear system can possibly process for attack. We call this *"stressing the system to determine weak links."* While there is some merit in this training method, its merit rests with contingencies involving Soviet-style massed forces. The CBS (and the warfare it supposes) train the processes designed to pummel or annihilate the threat. It does not complement our emerging Force XXI doctrine. Force XXI capabilities call for **targeting the correct entity** with the **right lethal weapon or nonlethal force** to achieve precision results.

Creating a Precision Training Environment

In this venue, precision results mean more than simply firing Army Tactical Missile Systems (ATACMS) rockets against a tank at 80 kilometers (km). They also mean placing psychological operations loudspeakers at the corner of 5th and Main. Precision operations imply the use of a "needle gun" type of targeting process, applying the force necessary to shape and decide tactical circumstances without the hub-to-hub application of force we have trained to apply.

For example, imagine the effects precision attacks would have against the threat commander's command and control (C^2) if we could simultaneously destroy the tanks of the battalion commander and company commanders surgically, without attacking the rest of their force. The entire unit would have to react to the instantaneous loss of their chain of command. Would they halt, disperse, retreat? Would the shock value make junior leaders hesitant to assume command? Almost certainly, the answer is *"yes."* However, we will not determine this while training with the current aggregate-level simulations. The point is simple: we cannot develop precision Force XXI warfighting skills without a precision training venue.

The creation of the precision training environment described requires two concurrent efforts. First, we must ensure entity-level fidelity in the simulation system. The time to accomplish this is during the simulation system's design and software development. Second, we must give the commander the same hands-on control of his assets that he enjoys in the real world by forcing the simulation to interface with our real-world command, control, communications, computer, and intelligence (C^4I) systems.

The first effort calls for object-oriented programming and a high-fidelity synthetic environment. We need battlespace variables replicated at the entity level. We need weather and terrain, cities with traffic jams, threat tank formations, and enemy fire detection-control-delivery processes. We need a virtual reality representation of the real world. This is the only way we can deal with the "fog of war" and properly train as we would fight. This technology is feasible, but it is expensive and time-intensive. We are approaching this caliber of programming with the Warfighter's Simulation (WARSIM) and its companion simulation, the WARSIM Intelligence Module (WIM). The design of these simulations will meet the demanding training requirements of Force XXI, and will reach initial operating capability (IOC) in April 2001. I will discuss these systems later in this article.

The second effort—interfaces to organic C^4I systems—**delivers the high-fidelity simulation control into the commander's tactical operations center** (TOC). We do this today with two training devices called FIRESTORM (the Federation of Intelligence, Reconnaissance, Surveillance, and Targeting, Operations, and Research Models) and CSTAR (the Combat Synthetic Training Assessment Range). These technological applications translate aggregate-level simulation feeds into templated semblances of entity simulations. The important word here is "semblances" of entity representations. FIRESTORM's translation of an aggregate-level tank battalion into its template 31 tanks may look and feel like entity operations, but it is not (see Figure 1). Targeting the individual entity requires the commander to find and attack the single tank that represents the aggregate-level battalion icon location with 31 from which to chose. Hitting the right tank yields disproportionate effects by degrading the entire battalion. Destroying any other templated entity has no effect on the tank battalion's combat strength. While this training methodology is not perfect, it is valuable in developing and exercising the precision targeting processes we will employ on the Force XXI battlefield.

Combat STAR

CSTAR takes the FIRESTORM approach a step further to create realistic intelligence play at the National Training Center (NTC). Our forces training at the NTC do not receive the benefit of intelligence assets that would normally be available to support their operations. The brigade entering the maneuver "box" can bring its direct support intelligence systems, but receives no support from the division and higher-echelon intelligence systems and organizations that would doctrinally support their fight. From an intelligence stand-

point, the unit is forced to fight with its feet bound and one hand tied behind its back.

CSTAR will resolve part of that dilemma by integrating the NTC's live-instrumented ranges with a constructive simulation wrapped around the NTC maneuver area. In effect, it expands NTC to a seamless 300-km by 300-km virtual world (see Figure 2). The simulation "plays" the intelligence assets at division and above in the simulation world. The constructive simulation "tracks" enemy forces until they enter the live maneuver box. NTC integrates the live instrumentation data into the virtual exercise area; the tactical commander in the box "sees" it all as one seamless picture. The commander can see the enemy situation outside the maneuver box. Deep operations employed against the enemy force in the constructive simulation can reduce the size of the force entering the live maneuver box to match the situation in the virtual world. The Simulation, Training and Instrumentation Command (STRICOM) will field CSTAR to Fort Hood, Texas, and NTC in fiscal year 1999, extending this hands-on capability to III Corps and units training at NTC.

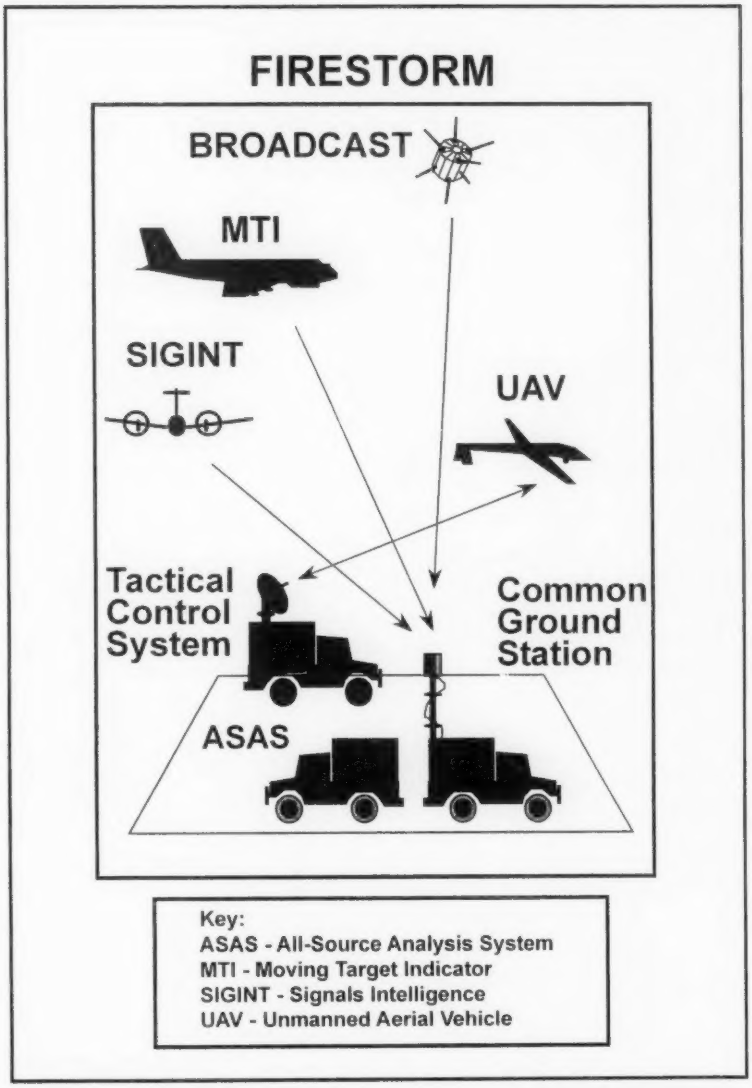


Figure 1. FIRESTORM takes data from aggregate simulations and produces templated entities moving on the terrain.

CSTAR made its debut in support of the Task Force XXI Advanced Warfighting Experiment (AWE) in March 1997. FIRESTORM made a strong showing at the Division XXI AWE (DAWE) the following November. Both enabled commanders to integrate entity-level simulations into their battle command processes, but neither have taken us to the level of simulation we need to develop Force XXI battle command and warfighting skills. The aggregate-level simulation employed during the DAWE, for example, matched U.S. Army heavy forces against a similarly equipped Soviet-style conventional force. Operational and tactical actions focused more on the force-on-force destruction of the threat's armored and mechanized capabilities, and less toward precisely shaping the battlespace to achieve the precision objectives real-world deployments entail. Soldiers nominated entity-level targets, but these entities were representative of aggregate-level icons. The entity-level fight was illusory, but still had great training value. The commanders and staffs relied on intelligence to visualize the battlefield with systems such as Joint STARS, the unmanned aerial vehicles (UAVs), and the All-Source Analysis System (ASAS). Intelligence systems fed three of the seven large-screen displays in the Division Tactical Command Post (DTAC). Commanders paid significant attention to the information displayed on these screens. They recognized the criticality of these systems, and commensurately extended their battlespace reach.

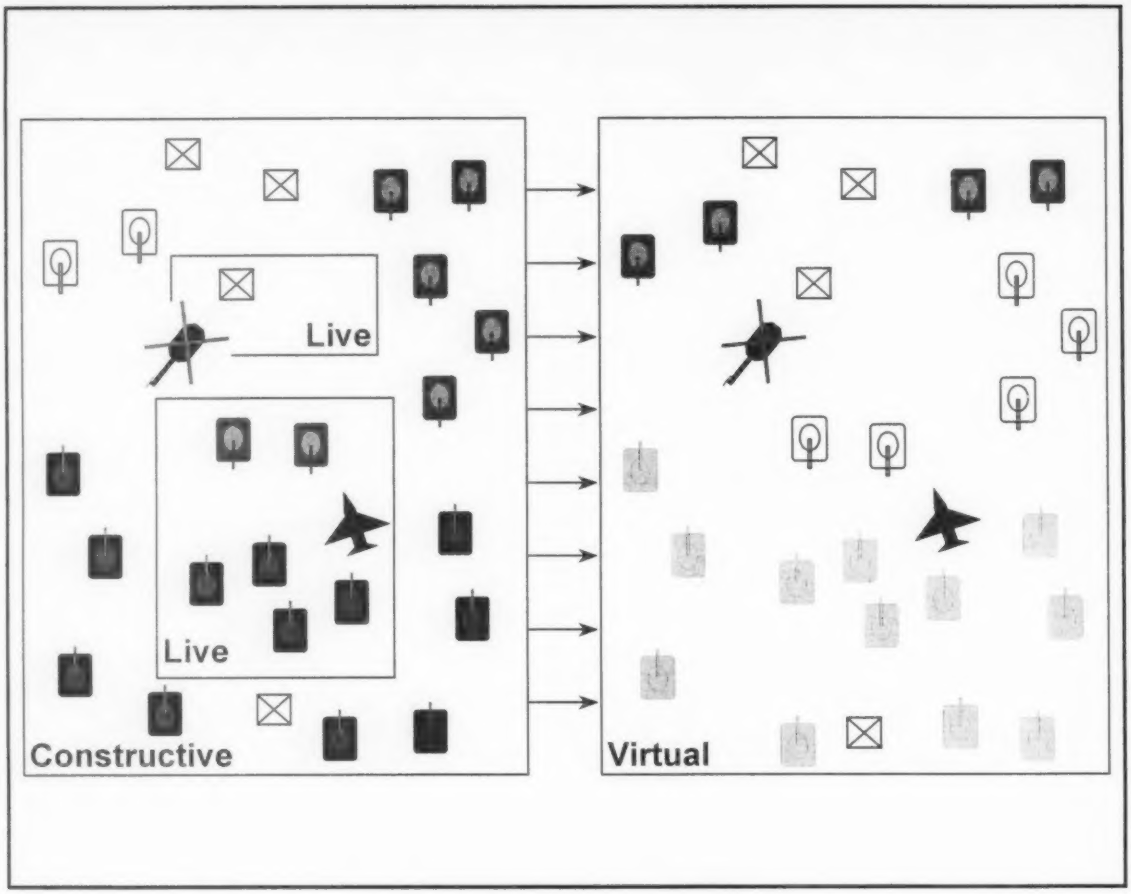


Figure 2. CSTAR Concept of Operations.

The Next Generation

The Department of Defense is building a new generation of entity-based simulations for use by all the Services. The overall project is the Joint Simulation System (JSIMS). Each of the Services has its respective component piece of the overall project (see Figure 3).

The Army is building the Warfighter's Simulation (WARSIM) and the WARSIM Intelligence Module (WIM). These two simulations will model the objects and processes necessary to support the training of ground combat arms, combat support, and combat service support units. The Army is also the executive agent responsible for building a synthetic natural environment or virtual operating world for the various simulation models to share. This will provide the "maneuver space" on land or sea in which our simulations forces operate.

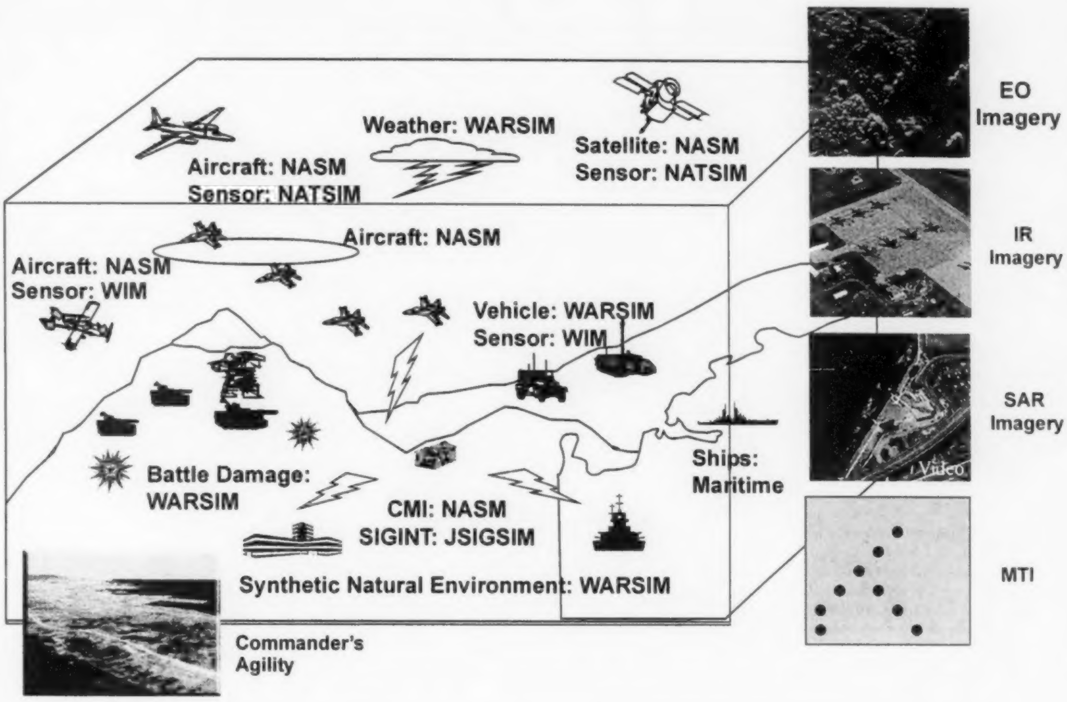
The Air Force is building the National Air and Space Model (NASM). NASM will model military operations in the atmosphere and in space. The Navy's JSIMS Maritime will model naval and amphibious operations. The Marine Corps is not developing a specific model, but will use portions of WARSIM and JSIMS Maritime to meet its training requirements.

In addition to WIM, two other intelligence simulations are under development within the JSIMS. The developers are creating the National Simulation (NATSIM) and the Joint SIGINT (signals intelligence) Simulation (J-SIGSIM) to model our national intelligence collectors and processes.

These simulations will collectively model the necessary platforms, weapons and sensors to replicate the joint battlefield properly at the entity level. Together, the JSIMS components will more closely represent reality in the 21st century battle.

Conclusion

In the near-term, we must satisfy the commanders' present requirements while ensuring continued development toward high-fidelity simulation demands. We must incorporate the functionality of



Key:

CMI	Civil-military infrastructure	JSIMS	Joint Simulation System
EO	Electro-optical	NASM	National Air and Space Model
IR	Infrared	NATSIM	National Simulation
JSIGSIM	Joint SIGINT Simulation	SAR	Synthetic aperture radar

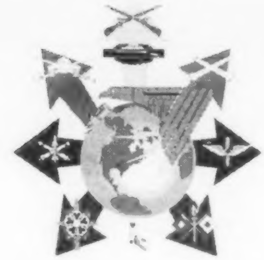
Figure 3. WARSIM/JSIMS Intelligence Concept of Operations.

FIRESTORM, CSTAR, and battlefield visualization capabilities in our future systems. Combat commanders soon will receive Force XXI equipment such as the CGS, the Outrider Tactical UAV, and ASAS-Remote Workstation, and we can expect a surge in simulations training requirements. Training with this equipment using real sensors and systems will prove very expensive (e.g., divisions can ill afford actual Joint STARS support) and physical space will prove constraining (no single post offers a 300-km by 300-km training area). Entity-based simulations will be our only means of developing and maintaining the Force XXI warfighting skills we need on the battlefield.

The author wishes to acknowledge and thank a good friend and exceptional intelligence officer, Major Forrest L. Davis (USA, Retired), for his outstanding contributions to this article. Over the last six years, Forrest and I have worked closely together as fellow Brigade S2s at the 82d Airborne Division and in the modeling and simulations world.

Major Steve Iwicki is currently serving at the 302d MI Battalion in Heidelberg, Germany. He completed a 30-month Pentagon tour as the Army Deputy Chief of Staff for Intelligence Modeling and Simulations Officer. He has also served in intelligence and staff positions at all echelons of the Army, except division staff. Significant positions he has held include Chief of Current Intelligence, Army Central Command during Operations DESERT SHIELD and STORM; XVIII Airborne (ABN) Corps G2 Planner for Operation RESTORE HOPE; Chief, Joint Intelligence Center Rear for Operation UPHOLD DEMOCRACY, Commander of the Army's first Joint STARS Ground Station Module Company; and S2, 82d Aviation Brigade, 82d Airborne Division. MAJ Iwicki holds a Bachelor of Science degree in Decision Sciences and Computers and a Master of Science in Strategic Intelligence. He is a graduate of the Command and General Staff College, and the Post-Graduate Intelligence Pro- gram, and the G2/ACE Chief Course. Readers can reach him via E-mail at g2depace@hq.c5.army.mil and telephonically at 011-49-6221-175256 or DSN (314) 370-5256.

Initiatives in Force Development: The Army Reprogramming Analysis Team



by Joseph T. Ingrao and James A. Holland, II

The division responsible for the development and modernization of Army intelligence systems for tactical and strategic use is the Department of the Army (DA) Deputy Chief of Staff for Operations and Planning (DCSOPS) Intelligence Electronic Warfare and Command and Control Countermeasures Division (IEW/C²CM). During the past decade, this division has provided oversight and Army staff coordination for the development and modernization of the systems and databases that provide critical information for today's commanders. These include the following items and more:

- Airborne systems (Guardrail Common Sensor (GRCS), Airborne Reconnaissance Low (ARL), QUICKFIX, Joint Surveillance Target Attack Radar System (Joint STARS)).
- Ground-based systems (All-Source Analysis System (ASAS), Ground-Based Common Sensor (GBCS), TEAMPACK).
- Databases (Electronic Warfare Integrated Reprogramming (EWIR), U.S. Non-Communications Systems (USNCS), and Kilting).
- Special programs (such as Tactical Exploitation of National Capabilities (TENCAP)).

The Division serves as the Army Staff point of contact for intelligence systems, their deployment, and their operational status worldwide. In this oversight role, the Division recognized that a void existed between the development of systems whose primary mission functions are based on embedded intelligence data, and the operational support of these systems with current and accurate intelligence information when fielded.

To provide a bridge between the development and subsequent employment of these "smart" weapons and sensors, the IEW/C²CM Division has funded a unique Army program, the Army Reprogramming Analysis Team (ARAT). This article describes the ARAT effort and its impact on force development, modernization, and operational support to the combat commander.

ARAT History

The ARAT effort traces its origins back as far as 1986, with the conclusions of an Army Science Board report recommending that the software in all sensors used to detect and classify target or threat signatures be reprogrammable. This software reprogrammability allows the updating of sensors to accommodate changes in the battlefield signature environment. These changes may be due to modifications to existing systems, detection of previously unknown modes of operation (also known as wartime reserve modes (WARM)), or the introduction of new systems in a theater of operations.

In 1988, the IEW/C²CM Division and U.S. Army Communications-Electronics Command (CECOM) began participating in the U.S. Air Force electronic combat Serene Byte reprogramming exercises. Their intent was providing updated embedded software libraries for Army aircraft and air defense (AD) systems. By 1990, when Iraq invaded Kuwait, the Army had an informal working capability for analysis and assessment of signature changes. The U.S. Army Training and Doctrine Command (TRADOC) centers and schools for aviation and AD, Program Executive Officer (PEO) Aviation and its Program Manager for Aviation Electronic Combat, and several CECOM offices and activities all provided personnel for this effort.

During Operations DESERT SHIELD and DESERT STORM, the task for this informal organization was to monitor intelligence data and produce signature information needed to update the databases on numerous aircraft and AD systems deployed to the theater. However, several weaknesses became apparent in the Army's capability to rapidly develop and install the new software. New threat and target information for aircraft-mounted Radar Signal Detection Sets (RSDS)—called mission data sets (MDS)—were ready by late September 1990, but the field units had no way to install the software locally. Contact teams with special equipment had to travel from the United States into the theater, and physically visit each system. In some cases, they could not install the changes before the start of ground operations.

At the conclusion of Operations DESERT SHIELD and STORM, the Division formally recommended that the Army initiate a quick response program. The objective of this effort was to address shortfalls in Army capability to

detect changes in the battlefield signature environment, and to develop better capabilities to reprogram, distribute, and install software in the timeframes necessary to be operationally effective. The U.S. Army created the ARAT Project to develop and field solutions to meet these requirements.

ARAT Project Mission and Roles

The ARAT Project has operated from the CECOM Software Engineering Center (SEC) since the signing of the ARAT implementation order by the DA DCSOPS in the fall of 1991. The ARAT effort provides signature analysis and software reprogramming, testing, distribution, and installation solutions in two major mission areas. These are ARAT support to the combat commander and fielded reprogrammable sensors and target sensing systems (TSS), and support to sensor and TSS development efforts.

To meet the requirements of these mission areas, the ARAT Project developed an Army TSS reprogramming process and infrastructure concept. The joint electronic warfare (EW) reprogramming community accepted the Army-developed process so widely that the Joint Services have adopted it, and it has been incorporated into the Joint Chiefs' of Staff (JCS) documents.

Support to Combat Forces

After defining the processes and infrastructure required to support Army operational requirements, the ARAT Project concentrated on providing urgently needed support for operational forces. In its first 24 months of operation, the ARAT Project focused on the organization, staffing, and equipping of the ARAT Threat Analysis (ARAT-TA) team that serves today as the combat units' primary point of contact for EW (see Figure 1).

ARAT-TA collocated with the U.S. Air Force Air Warfare Center (AFAWC) at Eglin Air Force Base (AFB), Florida. This combined location with the AFAWC allowed the Army and Air Force to share a common picture of the signature environment on a permanent basis for the first time. The Army was able to leverage substantial Air Force investments in communications and intelligence systems in exchange for improved support to Air Force heli-

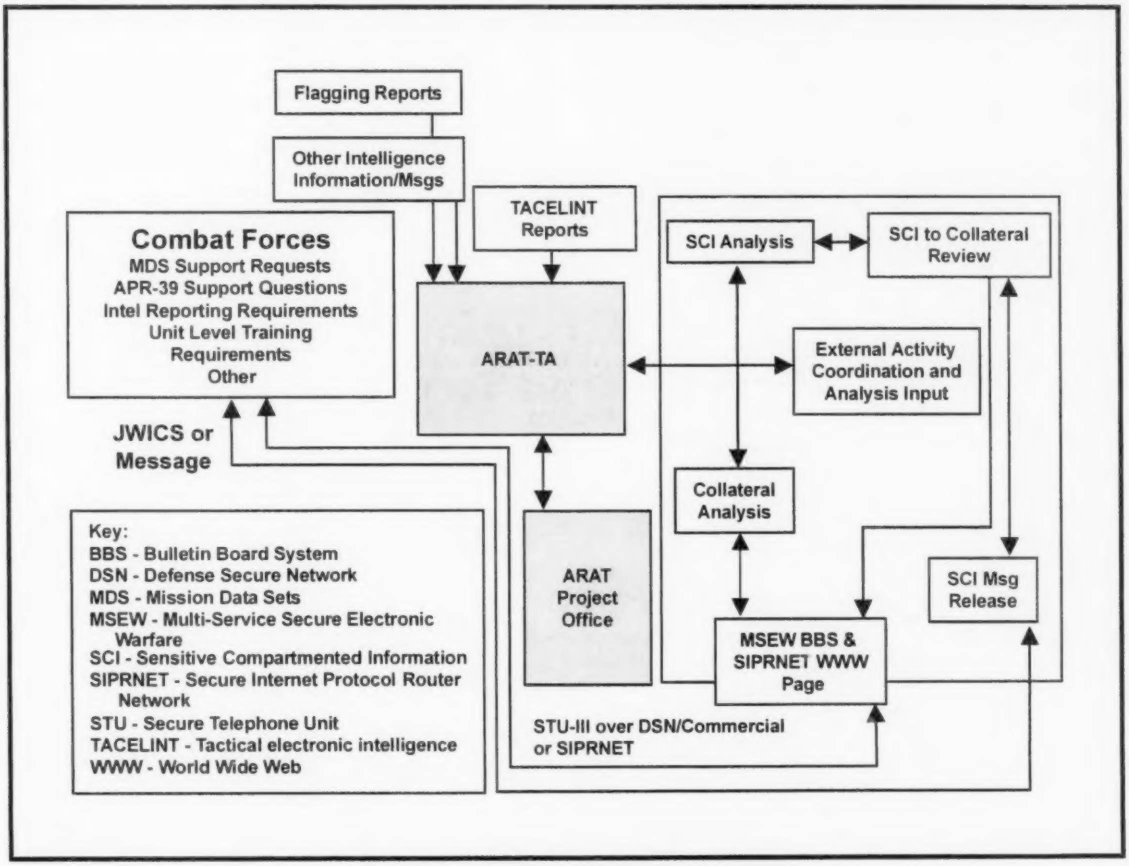


Figure 1. ARAT Threat Analysis Team.

copter and cargo aircraft that use Army-supported TSSs.

Over time, the ARAT-TA Eglin AFB operation expanded to include an activity at the U.S. Air Force Information Warfare Center (AFIWC), at Kelly AFB, Texas. The ARAT-TA operation at Kelly operates automated intelligence message processing models to ensure that U.S. Forces are aware of any signature changes—as they are detected—that may affect Army supported TSSs (see Figure 2).

To improve combat units' ability to request assistance on TSS capabilities and on reprogramming, the ARAT Project worked jointly with the Navy, Air Force, Marine Corps, and the Special Operations Forces. Together they established a digital communications capability with accessibility from anywhere in the world. The project developed a low-cost reprogramming kit for the AN/APR-39A(V1) RSDS and helped coordinate changes in the RSDS Operation Flight Program (OFP) software to allow field installation of new threat and target software by the aircrew. ARAT Project funds distributed this kit, costing a few hundred dollars, to Active Component, U.S. Army Reserve, and U.S. Army National Guard units. This combined approach has produced spectacular, quantifiable results.

In the first instance, reprogramming of the RSDS with new mission data in 1991 took months and

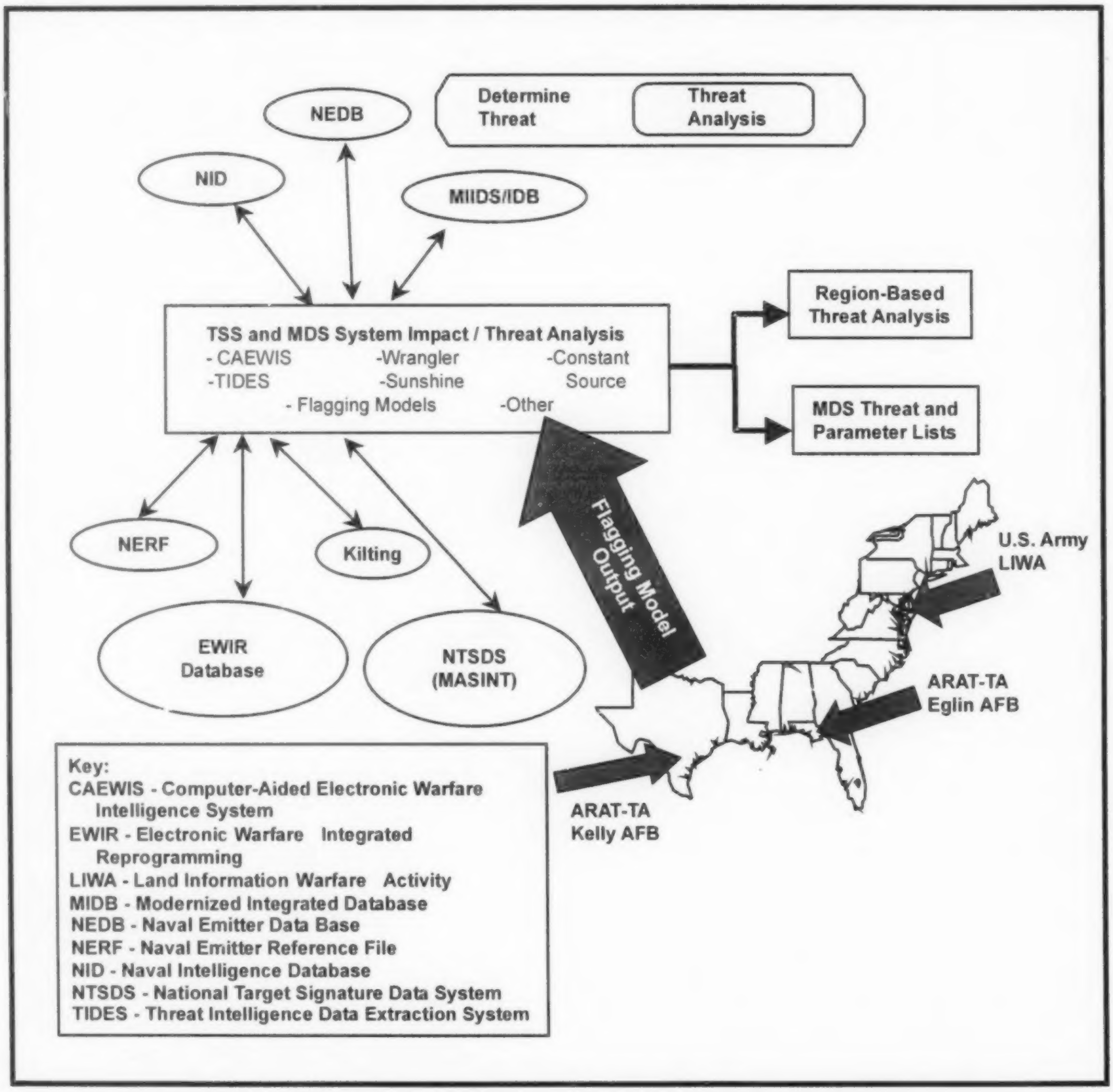


Figure 2. U.S. Forces Mission Data Sets Threat and Parameter Selection Process.

cost millions of dollars to accomplish. Today, crew members and unit-level or direct support maintenance personnel accomplish mission data software reprogramming in hours or days. They can complete it for the cost of the connection to the electronic distribution network (Defense Secure Network (DSN), commercial toll free, or the Secure Internet Protocol Router Network).

In another example, two data sets were available in 1991 for worldwide use of the RSDS. These data sets were general and had limited ability to clearly classify and display systems in many locations. There are now more than 20 active mission data sets for U.S. Forces and several more for our allies. The developers tailor these data sets to specific operational regions, and the sets are subject to constant analysis based on all-source intelligence data and intercepts.

Broad Impact

ARAT efforts affect a large number of Army systems. This happens whether the combat element or the developer receives ARAT or U.S. Army Land Information Warfare Activity (LIWA) ARAT-TA support directly, or just use one of the numerous databases or tools that the ARAT effort has helped to maintain. The platforms and weapons systems fall across battlefield functional areas including aviation, AD, fire support, and intelligence.

In addition to combat unit support, the ARAT Project has provided assistance to TSS material developers in the fire support, AD, aircraft survivability equipment (ASE), and aircraft sensor areas, including such systems as:

- HAWK and Patriot AD systems.
- Stinger missile.
- Non-cooperative target recognition (NCTR) systems.
- APACHE Longbow fire control radar and AN/APR-48 Radio-frequency Interferometer (RFI).
- AN/APR-39 family of RSDS.
- AN/AVR-2 Laser Warning Receiver (LWR).
- AN/ALQ-212 Suite of Integrated IR Countermeasures (SIIRCM).
- Armored vehicle survivability equipment.
- National Target Signature Data System (NTSDS).
- GRCS and ARL.
- SHORTSTOP proximity fuse countermeasure.

Additionally, support for these systems has included the coordination of threat and target signature analyses, resources for proof-of-concept analysis projects, and assistance in mission data software programming, distribution, and installation capability development.

For the AN/APR-39 RSDS family alone the current ARAT infrastructure produces estimated savings to the Army of more than $2.4 million per year for mission data software distribution and installation over previously methods. The reprogramming kits that cost a few hundred dollars each effectively complete the job for systems costing more than 100 times as much.

The ARAT Project Today

In 1996, the ARAT Project transferred operations and resource responsibilities of the ARAT-TA and its Kelly AFB element to the LIWA. The ARAT Project continues to provide research and development support to LIWA for ARAT-TA equipment and software tool modernization, funds the development of new automated intelligence processing models for use at Kelly AFB.

The ARAT Project also continues to provide assistance to any system developer that requires software reprogramming or installation assistance. Our efforts include solutions to problems of data availability and distribution, evaluation, and recommendations on lightweight field programming solutions, and ongoing modernization of the Army distribution infrastructure.

The Project recently received beta (test) software to automate unit mission data software tasks for the AN/APR-39A(V)1. ARAT has conducted extensive solution investigations for mission planning, self-protection, and targeting systems.

The ARAT Project provides personnel and funding for combat elements training at the unit level. In recent years, this has included on-site visits in Korea, Europe, Hawaii, and multiple locations in the United States. It has provided support for operational forces in Europe, the Middle East, Far East, South America, and other locations. The Project has also supported exercises such as Ulchi Focus Lens in South Korea and National Training Center rotations. ARAT personnel are regular guest lecturers at the U.S. Air Force Search and Rescue School, Army Aviation Center Electronic Warfare Officer (EWO) Course, and several other classes.

The ARAT Project also provides coordination of Army Foreign Military Sales (FMS) actions that require U.S.-derived signature data. This coordination includes intelligence data releaseability for the FMS case and arrangement of threat analysis and training services if purchased as part of the case.

Conclusion

Embedded signature data will be a significant factor to operational success and information dominance on future battlefields. The ARAT must continually evaluate and update this data as required to ensure optimum performance of TSSs, when needed. Through the ARAT effort, the IEW/C^{2}CM Division is providing direct assistance to ensure that the best available signature data is put into the hands of the combat commanders, when-

ever and wherever it is required. Contact the ARAT Project or the LIWA ARAT-TA for TSS reprogramming-related support needed to accomplish your mission.

You can contact the ARAT Project at E-mail ingrao@doim6.Monmouth.army.mil, by unclassified telephone (908) 532-1337 /6003 or DSN 992-1337/6003, and unclassified facsimile (908) 532- 5238 or DSN 992-5238. Their secure telephone number is (908) 532-6025 or DSN 992-6025. Their Internet address is http://www.lew.sed.Monmouth.army.mil and their mail address is ARAT Project, USACECOM, ATTN: AMSEL-SE- WS-AI, Fort Monmouth, NJ 07703. Readers can reach the ARAT-TA Team via E-mail at Svarrer@wg53.eglin.af.mil, by unclassified telephone (904) 882-8899/8919 or DSN 872-8899/8919, by facsimile (904) 882-4268/9835 or DSN 872-4268/9835, and secure telephone (904) 882-9609/10 or DSN 872-9609/10. The ARAT-TA Team's mailing address is U.S. ARAT, P.O. Box 2012, Eglin AFB, FL 32542-2012.

Mr. Ingrao is the Branch Chief for Electronic Combat at the U.S. Army CECOM Software Engineering Center (SEC). He began his career at SEC ten years ago as a project engineer for EW systems and has held many positions in this organization since then. The Electronic Combat Branch is the primary development and reprogramming facility for Army ASE. Mr. Ingrao graduated from the Pratt Institute in January 1984 with a Bachelor of Science (BS) degree in Electrical Engineering and will complete his Master of Science (MS) degree in Technologies Management this year. Readers can contact him via E-mail at ingrao@doim6.monmouth.army.mil and via telephone at (732) 532-1337 or DSN 992-1337.

Mr. Holland is a Senior Engineer with the Systems Development Division of SRI International. He served 14 years in the U.S. Army in a variety of staff positions in field artillery, material acquisition management, and tactical intel- ligence. His 20-year IEW background includes assignments in target acquisition and intelligence staff positions with CECOM, U.S. Army Test and Evaluation Command, V Corps Artillery, 82d Division (Airborne), and 2d Infantry Division. His last active duty assignment was as the initial project officer for the ARAT, where he was responsible for the development of an Army capability to reprogram signals and signatures rapidly into Army "smart" weapons and sensors. Mr. Holland graduated from the University of Michigan with a BS degree in Natural Resources with concentrations in Engineering and Remote Sensing and obtained an MS degree in Electrical Engineering at the University of Delaware. You can reach him via E-mail at holland@wdc.sri.com and by telephone at (301) 862-4507.

Joint STARSCommon Ground Station

(Continued from page 32)

and maintainers. The trainer uses the core software from the CGS system and makes maximum use of COTS hardware and software. The CGS trainer can operate in the distributed interactive simulation (DIS) environment. Plans for the system include linking with the 93d ACW operational base to provide realistic simulations and to aid in ground and aircrew training.

For units with fielded CGSs, embedded training support allows the unit to train for and participate in both Warfighter exercises and other simulation-driven exercises. The system will directly receive and display Corps Battle Simulation (CBS) data. Additionally, operators can input the saved data from prior simulation-driven exercises to their CGSs to focus their training on specific tasks and events. With P^3I upgrades, CGS will support training and simulation capabilities for crews, battle commanders, and their staffs.

Conclusion

The Common Ground Station has proven to be a critical tool for situation development and targeting. Joint STARS and the CGS provide commanders at all echelons with a common, near- real-time, integrated view of the battlefield. The system continues to evolve, capitalizing on direct user feedback and the CGS open-system hardware and software architecture. The Joint STARS CGS system is the first joint service, multisensor tactical system that provides commanders at all echelons a real-time, situational awareness and targeting capability. It is important for MI leaders to understand the extensive operational and exploitation capabilities of the CGS and its associated workstations as well as to realize its potential for the commander.

Endnote

1. For a good explanation of spiral development, see Endnote 2 in Colonel Elliott's article that begins on page 5.

Colonel Cryblskey is currently the Director for Army Programs, Motorola Systems Solutions Group. He was the U.S. Army Training and Doctrine Command (TRADOC) System Manager (TSM) Joint STARS from 1985 through 1989 and retired from the Army in 1992. His last position was in the Pentagon as the Director for Aviation and Intelligence Systems, Office of the Assistant Secretary of the Army for Research, Development, and Acquisition (SARDA). COL Cryblskey has a Bachelor of Science degree in Aeronautics from Embery Riddl Unniversity and a Master of Business Management degree fromCentral Michigan University. His telephone number is (703) 413-2508 and his E-mail address is Ted_Cryblskley-P26172@email.mot.com.

Major Beck is the System Integrator for Joint STARS CGS and JTT in the Office of the Deputy Chief of Staff for Operations and Plans, Force Development. He has served in a variety of staff and command positions in Europe, Korea, and the Continental United States, including service in the 8th Infantry Division (Mechanized) (8ID(M)), 24 ID(M), and 82d Airborne Division. MAJ Beck has earned a promotion effective early next year. MAJ Beck has a Bachelor of Science degree in Regional Studies from Georgetown University. Readers can contact him at (703) 697-6528, DSN 227-6528, and via E-mail at beckjof@hqda.army.mil.

CONCEPTS & DOCTRINE

by Stephen B. Leeder

The Doctrine Division needs your input on a number of issues requiring resolution in the coming months. Field input is critical to develop viable doctrine that drives training and the force structure, and that you must eventually execute. This article only addresses a sampling of the many doctrinal issues the military intelligence community faces.

FM 101-5

Two significant changes occurred with the approval of **FM 101-5, Staff Organization and Operations**, in May 1997. These changes seem to have gone largely unnoticed except for some discussion with Battle Command Training Program (BCTP) personnel and other organizations from Fort Leavenworth, Kansas.

The intent and format for the Intelligence Estimate changed radically. With approval of **FM 101-5**, the Intelligence Estimate follows the basic format of all other staff estimates and is designed to rank order friendly courses of action (COAs) based on the ability of the intelligence system to support those COAs.

Previously the Intelligence Estimate was a textual description of the environment and enemy capabilities, COAs, strengths, and vulnerabilities. In the new **FM 101-5**, unspecified initial intelligence preparation of the battlefield (IPB) products replaced the old textual format. However, the standard doctrinal IPB products (the modified combined obstacle overlay, situation template, event template, and event analysis matrix) do not cover all of the information that was contained in the Intelligence Estimate.

These two changes drive the need to change the description of the Intelligence Estimate and fill a few gaps in a number of our manuals. Other changes include the need for:

- Several good examples of Intelligence Estimates in the different intelligence echelons manuals (**FM 34-80, Brigade and Battalion IEW Operations**, **FM 34-10 Division IEW Operations**, **FM 34-25, Corps IEW Operations**, and **FM 34-37, Echelons Above Corps IEW Operations**).
- A solid discussion of how the Intelligence Estimate ties into the collection management process (**FM 34-2, Collection Management and Synchronization**).
- Several new examples of graphic and some text-based IPB products to fill some of the gaps left by the old text-based Intelligence Estimate (**FM 34-130, Intelligence Preparation of the Battlefield**).

IPB

The Doctrine Division is now in the early stages of revising **FM 34-130**. Some additions to the solid foundation that the last approved manual provides include:

- A discussion and several examples of the unique nature of both "low-tech" and "high-tech" IPB support to information operations.
- A description of initial IPB products. These products are necessary early in step two of the military decision-making process (Mission Analysis) to drive the development of other portions on mission analysis and subsequent steps.
- Several more good examples of IPB in stability operations and support operations.
- The addition of an appendix on IPB in support of military operations in urban terrain (MOUT).

Brigade ISR Operations

A clear description of how the brigade staff plans and executes intelligence, surveillance, and reconnaissance (ISR) operations is imperative as the Intelligence Center and other doctrinal proponents move forward to Force XXI concepts and emerging doctrine. Several associated issues include:

- A clear and definitive description of the role of the Brigade Reconnaissance Troop commander to include his role in staff planning and the execution of the operation.
- Techniques to avoid repeating the same recurring reconnaissance and surveillance deficiencies as identified in years of lessons learned from the Combat Training Centers (CTCs).
- Tactics, techniques, and procedures (TTP) for retasking and cross-cueing ISR assets while maintaining synchronized operations. These procedures must ensure assets are not wasted. This includes sample products and fragmentary orders to dynamically adjust the ISR effort. Additionally, the TTP need to draw the distinction of using assets for situation development or support to targeting.
- A good example of Annex L, Reconnaissance and Surveillance, in accordance with **FM 101-5.**

Brigade ACT

Currently, there is not adequate doctrine on the analysis and control team and ACT operations. **FM 34-80, Brigade and Battalion IEW Operations**, needs to:

- Clearly assign the different responsibilities between the ACT and the Brigade S2 section.
- Assign and deconflict the role of the Direct Support MI Company commander's command and planning responsibilities.
- Assign and deconflict the roles of the ACT and operations platoon leaders.

Conclusion

Your input is critical. Please E-mail us at leeders@huachuca-emh1.army.mil and surf our web pages at least once a month at http://138.27.35.36/Doctrine/dlb.htm. Close coordination with the real "motorpool" Army is necessary so that we can serve as your conduit to the doctrinal development process. We welcome input at anytime on any of the 34-series manuals or doctrinal and TTP issues. Please be sure to provide specific comments and a sufficient justification to maximize the strength of your comments.

PROPONENT NOTES

MI Battalion, Division XXI

The Division XXI MI Battalion Table of Organization and Equipment (TO&E) was developed from and is very similar to the MI Battalion, Heavy Division, 34395A000. The major changes are discussed below.

A seven-person Analysis and Control Team (ACT) has been added to the Analysis and Control Element (ACE). This additional team is available to provide support to either the Division's Aviation Brigade or Field Artillery Brigade.

The Counterintelligence and Interrogation Teams have been removed from the Direct Support Companies and placed in the General Support Company. The three Interrogation Technician Warrant Officers that had been in the DS Companies were removed, yielding a total of eighteen human intelligence (HUMINT) positions in the GS Company, a loss of three positions (Interrogation Technician Warrant Officers).

In the Communications-Electronic (CE) Operations Section of the Headquarters, Headquarters and Operations Company (HHOC), one Signal Information Service Specialist (military occupational specialty (MOS) 31U) was moved to the General Support Company's Headquarters, raising the number in the GS Company to two. Three Data Systems Integrators (MOS 74C) were added to the CE Operations Section.

Two 5-ton expandable vans were added to the ACE, raising the total to four. All ACTs were equipped with Standard Integrated Command Post System (SICPS) Rigid Wall Shelters mounted on Heavy HMMWVs, as well as the Battalion S1 and S3 sections. The point of contact (POC) is Ms. Wilma Bernardo at E-mail bernardow@huachuca-emh1.army.mil and telephonically at (520) 538-0869 or DSN 879-0869.

Life-Cycle Management Changes for Enlisted MI Soldiers

Mission Essential Task List (METL) involved the eight Life Cycle Management functions: Structure, Acquisition, Individual Training and Education, Distribution, Unit Deployment, Sustainment, Professional Development, and Separa tion. Problems meeting recruiting goals, academic attrition, and below Army average retention continue to be serious issues of concern. Aggressive recruiting programs, reducing academic attrition, and increased incentives to maintain high quality personnel remain our first priority. We have started a quarterly newsletter to keep the field informed on issues affecting our enlisted force. POC is MSG Paul Moore via E-mail at and by telephone at (520) 533- 1174 or DSN 821-1174.

Warrant Officer Accessions

During fiscal year 1999, we were unable to meet accession goals for MOS 351B, Counterintelligence Technician and MOS 351EKP, HUMINT Collection Technician (Korean). Based on that, ODCSPER has agreed to permit a liberal Active Federal Service (AFS) Waiver policy to assist us in meeting accession goals for those two MOSs. The target population for these waivers will be NCOs with excellent records between 12 to 13 1/2 years AFS. Review of each waiver request is on a case-by-case basis. To receive favorable consideration for this AFS Waiver, the individual must not require any other waivers and should possess at least an Associate Degree. Any questions on these waivers should be addressed to CW5 Rex Williams, Office of the Chief, Military Intelligence at

Intelligence at DSN 821-1183 or commercial (520) 533-1183 or E-mail williamsx@huachuca-em h1. army.mil.

Branch Detail Time Reduction

The DCSPER has recently announced a new policy to reduce pin-on time to CPT from 48 months to 42 months. Consequently, the MI Branch Detail obligation (48 months) would give the Branch Detail "receiver Branches" (Air Defense, Armor, Chemical, Field Artillery, and Infantry) 6 months of our officers' critical CPT time. In order to maximize our ability to fill CPT positions, OCMI and MI Branch, PERSCOM are exploring the possibility of reducing our Branch Detail obligation to 36 months (roughly when the officers are notified for promotion). The POC is CPT Cal Downey at E-mail downeyc@huachuca-emh1.army. mil and telephonically at (520) 533-1180 or DSN 821-1180.

Officer Accessions Trends

OCMI is studying the impact of a potential shift in MI accessions composition. This year's Branch Detail bill for the Army roughly doubled (from an average of 350 to 813). This results from Officer Restructure Initiative (ORI), which downgraded CPT requirements to LT, and from Force XXI requirement increases. The traditional Branch Detail receiver branches have more LT requirements than before. MI normally receives significantly more, 200 percent more "home grown" officers than authorizations. These extra lieutenants have filled our CPT shortages. With this change, MI still retains more "home grown" officers than authorizations, but the Branch Detail population will grow by about 25 percent. The POC is CPT Cal Downey at downeyc@ huachuca-emh1.army.mil and telephonically at (520) 533-1180 or DSN 821-1180.

AEPDS and ASAS Basis of Issue Plans

The Advanced Electronic Processing Dissemination System (AEPDS) is a Corps and echelons above corps (EAC) processor and preprocessor of National and Theater intelligence. It receives and processes raw data from selected national sensors, stores processed data, and pro- duces intelligence and imagery products. Additionally, it acts as a preprocessor for the All-Source Analysis System (ASAS), Common Ground Station (CGS), Digital Topographic Support System (DTSS), and is interoperable with all corps and EAC communications systems. AEPDS is organic to the Analysis and Control Element (ACE) of the CORPS MI Brigade and the EAC MI Brigade with a basis of issue equaling one per Operations Battalion.

The All-Source Analysis System (ASAS) Block II will be in MI organizations and staffs at battalion, Armored Cavalry Regiment (ACR) and separate brigade, brigade, division, corps and EAC. It provides auto- mated intelligence and information management to integrate IEW sensors, preprocessors, the ASAS, and the Army Battle Command System (ABCS).

Block II initiatives include a Common Operating Environment (COE-UNIX based), a reconfiguration of ASAS communication components into SICPS shelters, integration of the DOD standard collection management system, and some additional operational and functional software enhancements. Additionally, CI/HUMINT automation support will consist of the CI/HUMINT Automated Tool Set (CHATS).

These BOIP are undergoing final validation at DA. Anticipate changes to personnel and equipment in the ASAS validations. The POC is Sergeant First Class Ronald J. Miceli. His E-mail is micelir@ huachuca-emh1.army.mil and his telephone number is (520) 533-1189 or DSN 821-1189.

Share Your Photographs

To better support your articles, we request that our readers send photographs of MI operations, equipment, and exercises. These photographs should be copyright free. Include the full name of the photographer, and a brief note explanning what is in the picture. Please identify the people in the photo. The photos can be color or black-and-white, and they should be clear and in focus. Digital photos should be 300 dots-per-inch or better resolution; we prefer 600 dpi. Provide a return mailing address, and we will return the photos if so requested.

TSM NOTES

Force Modernization—One Person Can Make a Difference!

by Colonel Jerry V. Proctor

This issue of ***Military Intelligence*** focuses on "Force Modernization of Military Intelligence" and readers should learn a great deal about ongoing development of our MI systems. Many of the articles were written by Program or Project Manager (PM) offices, reviewed by the Army Deputy Chief of Staff for Operations (DCSOPS), Force Integration Office, and by the U.S. Army Training and Doctrine Command (TRADOC) System Manager (TSM) offices or Director of Combat Developments offices—in short an impressive list of lofty sounding places. The flavor of these imposing-sounding offices might lead an average soldier to feel, *"all this force modernization stuff is going on well above* ***my*** *head. I probably couldn't influence this mess if I wanted to."* Also, soldiers may feel frustrated if they do have good ideas because they may have no idea where to make entry into this collage of "ivory towers." Well, entry into and influence of the force modernization system is neither hard nor need it be unsuccessful.

Let me present an actual example. In using this example, I will refer to the All-Source Analysis System (ASAS) but influence over other systems is similarly easy. In December 1997, the Counterintelligence and Human Intelligence (CI/HUMINT) Program Development Office, PM ASAS got a rush order. They were directed to issue and field the new CI/HUMINT Automation Tool Set (CHATS) suitcase-sized reporting device to soldiers deploying to Operation DESERT THUNDER. The fielding was done as fast as possible, some would say it was a "drive-by fielding." The soldiers received training, but only as much as time constraints would allow.

The soldiers almost immediately deployed to the Middle East and, while having some success with the CHATS device, they realized several essential communications interface capabilities were missing. In this example, the CHATS did not have a PCIM card allowing the CHATS to interface directly with tactical networks. The initial design of CHATS envisioned telephonic interface. Clearly, the CHATS had a deficiency in its tactical communications capabilities.

One of the deployed soldiers noted this deficiency and notified his company and battalion commanders, in addition to sending several E-mail messages suggesting a fix for the shortfall. Fortunately, one office that received this traffic was the TSM ASAS Office. A quick evaluation of the problem and confirmation with the unit leadership verified a definite requirement for change. The TSM Office and the ASAS CI/HUMINT PM office conferred and determined what type of communications card would remedy the situation. We sent word to the unit that, for the short term, they could get an upgrade of this capability and, more importantly, we will ensure that this new capability will be in all new systems.

This example of one person's impact transpired from about January through March 1998. In early June, the ASAS PM Office briefed the TSM ASAS Office on system upgrades that would take place with fiscal year 1999 equipment buys. They include this PCIM card.

The short moral of this story is that one user noticed a system deficiency. He recognized it, told his chain of command, and sent E-mail messages to several offices including the TSM ASAS. It is all TSMs' responsibility to represent and work to satisfy valid user requirements in the acquisition world. In this simple example, one soldier made a difference, just as you can. Take the time to notify your TSM Office, whether for ASAS, Common Ground Station (CGS), unmanned aerial vehicle (UAV), Aerial Common Sensor (ACS), or the Futures Directorate points of contact. One voice does make a difference: be that voice!

Colonel Jerry Proctor is the TSM ASAS and the Deputy TSM is Mr. Michael Strack. Readers can E-mail them at proctorj1@huachuca-emh1.army.mil and strackm@huachuca-emh1.army.mil. You can reach them telephonically at (520) 533-3504/7 or DSN 821-3504/7.

RESERVE COMPONENT

The purpose of this article is simple and straightforward: to get the word out on MI course attendance prerequisites for Reserve Component (RC) soldiers. The Army Intelligence Proponent is making every effort to disseminate these requirements through the many means available. We need to stem the flow of RC soldiers arriving for training at the five U.S. Army Reserve (USAR) Total Army School System (TASS) MI Battalions without meeting one or several of the course attendance prerequisites.

Approximately 60 to 70 percent of the students that arrive for in-processing have not had thorough screening by their parent or sending units. This puts an unnecessary burden on the schoolhouse to verify requirements with a very thin staff. TASS MI battalions are checking all prerequisites, not just height and weight, Army physical fitness test (APFT), and prior phase completion (if required). They are drawing the line while maintaining a realistic degree of flexibility toward ensuring a soldier's suitability to receive and succeed in training. In so doing, they are fulfilling their regulatory roles as accredited training institutions to verify prerequisites. Figure 1 identifies the most critical prerequisites for admittance to RC TASS MI courses that the five USAR schoolhouses offer. The point of contact (POC) for this article is Major Joseph E. Hoellerer, the Title XI Officer; you can reach him at E-mail hoellererj@huachuca-emh1.army.mil or by telephone at (520) 533-2290 or DSN 821-2290.

Colonel John Craig is the USAR POC and the Chief of the Reserve Forces Office at the U.S. Army Intelligence Center and Fort Huachuca. Readers can contact him at (520) 533-1176, DSN 821-1176, and via E-mail at craigj@huachuca-emh1.army.mil. Lieutenant Colonel Steve Ponder is the Army National Guard POC; his telephone number is (520) 533-1177 or DSN 821-1177 and his E-mail addresses are ponders@huachuca-emh1.army.mil and ponders@aol.com. Their facsimile number is DSN 821-1762 or commercial (520) 533-1762. Their mailing address is Commander, USAIC&FH, ATTN: ATZS-RA, Fort Huachuca, AZ 85613-6000.

MI Course Attendance Prerequisites (RC)

Course	Grade/MOS requirement	Prerequisite Schooling	Security Clearance	PULHES	Vision or Hearing	AR 600-9 Ht/Wt	ASVAB Score	Comments
96B10	RC E1-E8	None	Final S w/ TS submitted	222221	Normal Color Vision	Yes	105 ST	
96B30	RC PMOS 96B	PLDC	TS w/ SCI Elig	222221		Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course
96D10	RC E1-E8	None	TS w/SCI Elig	222211	Normal Color Vision	Yes	105 ST	Near color vision correctable to 14/14 Std Snellen; distant vision correctable to 20/20 Std Snellen; normal stereoscopic acuity with or without correction
96D30	RC PMOS 96D	PLDC	TS w/SCI Elig	222211		Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course
96R10	RC E1-E8	None	Final S	222121	Pass Hearing Test	Yes	85 EL 95 SC	Hearing test on audiometer wherin sound amplitude must not exceed 15 decibels at Freq 250, 500, 1000, 2000, and 40000 CPS (Hz)
96R30	RC PMOS 96R	PLDC	Final S	222121		Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course
97B10	RC E1-E8	None	Final S w/ TS submitted	222221	Normal Color Vision	Yes	105 ST	Successful final adjudication of the MI applicant interview process, IAW DA Pam 600-8, procedure 3-33, prior to enrollment into phase one

Course	Grade/MOS requirement	Prerequisite Schooling	Security Clearance	PULHES	Vision or Hearing	AR 600-9 Ht/Wt	ASVAB Score	Comments
97B30	RC PMOS 97B	PLDC	TS w/ SCI Elig	222221		Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course
97E10	RC E1-E8	None	Final S	222221	Normal Color Vision	Yes	95 ST	Passing score on ECLT; qualifying score of 2/2 on DLPT
97E30	RC PMOS 97E	PLDC	Final S	222221		Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course; qualifying score of 2/2 on DLPT
97L10	RC E1-E8	None	Final S	222221		Yes	95 ST	Passing score on ECLT; qualifying score of 2/2 on DLPT
98G10QB	RC E1-E8	None	TS w/ SCI Elig	222121	Pass Hearing Test; Normal Color Vision	Yes	95 ST	Meet hearing acuity test std per AR 40-501; qualifying score of 2/2 on DLPT
98G30	RC PMOS 98G	PLDC	TS w/ SCI Elig	222121		Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course
98C30	RC PMOS 98C	PLDC	TS w/ SCI Elig			Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course
98J30	RC PMOS 98J	PLDC	TS w/ SCI Elig			Yes		Unit Cdr recommendation; meet all USASMA reqmts; graduate of prior phases of course
96/98 CMF ANCOC	RC E6-E7	BNCOC	Meet MOS requirement			Yes		Meet all USASMA reqmts; graduate of prior phases of course
Strat Debriefer Course	DOD personnel w/ psn requiring ASI		Final S					Type 25 words per minute
35D (MI-OTC)	2LT-MAJ		Final S w/ TS submitted			Yes		
35C		MIOAC	TS w/ SCI Elig			Yes		Pass stereoscopic vision and standard color blindness exam prior to selection for trng
35E	RC CPT and above	MI OAC	TS w/ SCI Elig			Yes		
35G		MI OAC	TS w/ SCI Elig			Yes		

Key:

ASI Additional Skill Identifier

BNCOC Basic Noncommissioned Officer Course

CPS Cycles per second

DA Department of the Army

DLP Defense Language Proficiency Test

DOD Department of Defense

ECLT English Comprehension Level Test

IAW In accordance with

MIOAC Military Intelligence Officer Advanced Course

MOS Military occupational specialty

PLDC Primary Leadership Development Course

PMOS Primary MOS

S Secret

SCI Sensitive Compartmented Information

TS Top Secret

USASMA U.S. Army Sergeants Major Academy

MI Corps Hall of Fame Nominations

The Office of the Chief of Military Intelligence (OCMI) accepts nominations throughout the year for the MI Hall of Fame (HOF). Officers, warrant officers, enlisted soldiers, or civilians who have served in a U.S. Army intelligence unit or in anintelligence position with the U.S. Army are eligible for nomination. A nominee must have made a significant contribution to MI that reflects favorably on the MI Corps. The OCMI provides information on nomination procedures. If you wishto nominate someone, contact OCMI, U.S. Army Intelligence Center and Fort Huachuca, ATTN: ATZS-CDR (Mr. Chambers), Fort Huachuca, AZ 85613-6000, call commercial (520) 533-1178 or DSN 821-1178, and via E-mail at chambersj@huachuca-emh1.army.mil.

*U.S. Government Printing Office: 1999 — 781-027/64505

504th Military Intelligence Brigade

Oriental blue and silver gray are the colors use for military intelligence; blue and gold signify loyalty and accomplishment. Wings connote loftiness, the vantage point for visual observation. The lightning flash and checkered area represent technological capabilities; together they symbolize vigilant leadership, celerity, and communications. The checkered area and lighting flash also allude to the organization's concern either strategic control over hostile communications and the security of friendly communications. The demi-fleur-de-lis, lightning flash, wings, and checkered area also refer to the lineage of the organization when constituted in 1942 as the 137th Signal Radio Intelligence Company, Aviation. The demi-fleur-de-lis also denotes the Meritorious Service Commendation Streamer awarded the unit.

The 504th Military Intelligence Brigade traces its lineage to the early days of World War II as the 137th Signal Radio Intelligence Company (Aviation). It received battle streamers for the campaigns of Northern France, Central Europe, and the Rhineland.

The brigade was reorganized a number of times in the intervening years. The forerunner of the brigade had a variety of missions that affiliated it with the National Broadcasting Company and the Army Security Agency. Redesignated the 504th MI Group (Corps) on 21 April 1978, the brigade began its evolution to its present structure. The group reorganized on 16 April 1982 as the Army's first corps-level intelligence support unit under the Combat Electronic Warfare Intelligence (CEWI) concept. On 16 September 1985, the 504th MI Group was redesignated the 504th MI Brigade (Corps) and now supports the intelligence requirements of the Mobile Armored Corps.

Under redesignation, the brigade reconstituted a complete 15th MI Battalion (Aerial Exploitation), thus reestablishing a long-term affiliation and serving to compliment the intelligence efforts of the 163d MI Battalion (Technical Exploitation), the 303d MI Battalion (Operations), and the Headquarters Detachment. On 15 September 1997, the 163d MI Battalion inactivated, leaving performance of the brigade's TE mission to the 221st MI Battalion (TE), Georgia Army National Guard, which activated on 1 October 1998.

The brigade encompasses all tactical intelligence disciplines and serves as the Army's Corps Intelligence Test Bed. Its capabilities include analysis and production, imagery intelligence, air- and ground-based signals intelligence, as well as multidiscipline counterintelligence support to the Corps. The 504th MI Brigade regularly participates in exercises and deployments throughout the world to include Korea, Bosnia, Haiti, and Southwest Asia.

ALWAYS READY!

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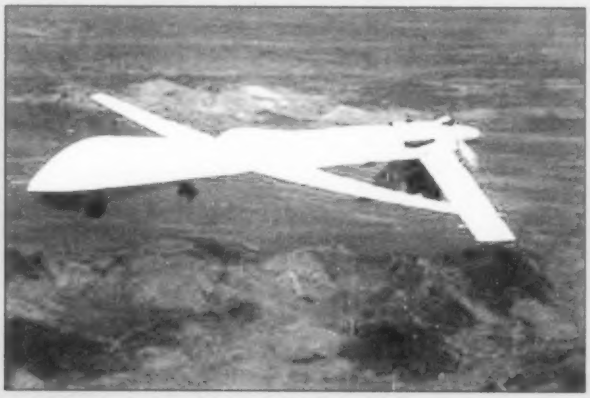

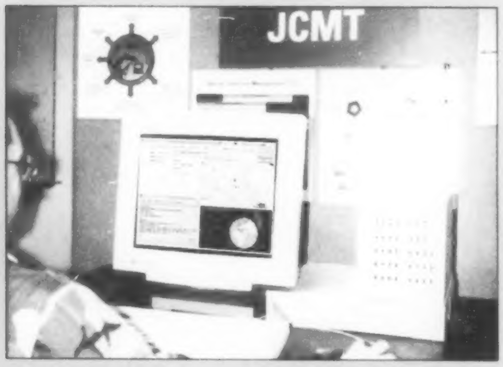

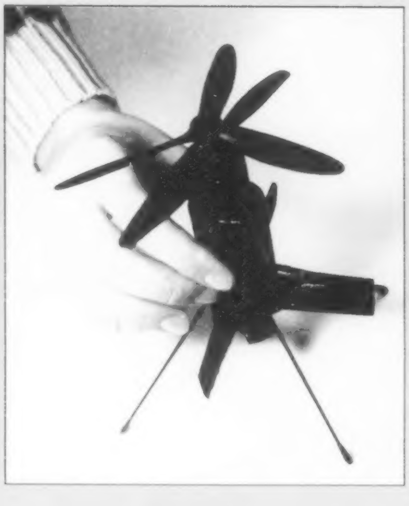

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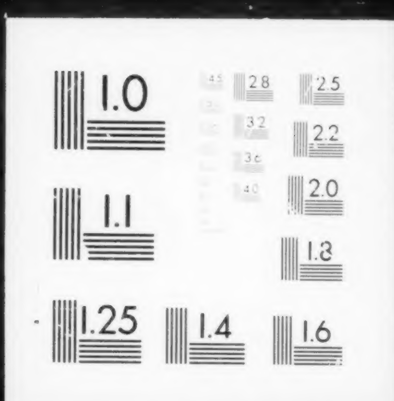
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